



Marathon Oil

**NM OIL CONSERVATION
ARTESIA DISTRICT**

SEP 03 2018

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Marathon Oil

Eddy County, NM

Hermes Fee 23-28-30

WA #1H

OH

MWD 164'-14143' PTB 14203'

Anticollision Report

02 February, 2018



PRODIRECTIONAL

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Reference	MWD 164'-14143' PTB 14203'				
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria				
Interpolation Method:	MD Interval 100.00usft		Error Model:	ISCWSA	
Depth Range:	Unlimited		Scan Method:	Closest Approach 3D	
Results Limited by:	Maximum center-center distance of 10,000.00 usft		Error Surface:	Pedal Curve	
Warning Levels Evaluated at:	2.00 Sigma		Casing Method:	Not applied	

Survey Program		Date 2/2/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
164.00	14,203.00	Survey #1 (OH)	MWD+IFR1	OWSG MWD + IFR1	

Summary		Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Site Name							
Offset Well - Wellbore - Design							
Hermes Fee 23-28-30							
TB #3H - OH - MWD 164'-13873' PTB 13930'		1,501.67	1,500.16	46.72	36.74	4.683	CC
TB #3H - OH - MWD 164'-13873' PTB 13930'		1,600.00	1,598.53	47.32	36.64	4.432	ES
TB #3H - OH - MWD 164'-13873' PTB 13930'		3,300.00	3,294.17	67.70	45.25	3.016	SF
TB #3H - OH - Plan #4		1,598.86	1,602.50	18.96	8.15	1.753	CC
TB #3H - OH - Plan #4		1,700.00	1,701.36	19.22	7.70	1.668	ES
TB #3H - OH - Plan #4		1,800.00	1,801.37	19.97	7.74	1.633	SF
WXY #5H - OH - MWD 164'-14029' PTB 14081'		0.00	0.00	50.02			
WXY #5H - OH - MWD 164'-14029' PTB 14081'		100.00	99.69	50.16	49.88	177.485	ES
WXY #5H - OH - MWD 164'-14029' PTB 14081'		2,800.00	2,793.54	112.84	93.72	5.901	SF
WXY #5H - OH - Plan #4		200.00	200.06	49.63	48.76	57.086	CC
WXY #5H - OH - Plan #4		2,800.00	2,797.20	55.12	35.90	2.868	ES
WXY #5H - OH - Plan #4		2,900.00	2,897.04	56.93	37.03	2.860	SF

Offset Design Hermes Fee 23-28-30 - TB #3H - OH - MWD 164'-13873' PTB 13930'												Offset Site Error:	0.00 usft
Survey Program: 164-MWD+IFR1												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-89.92	0.07	-50.03	50.03				
100.00	99.99	99.89	99.89	0.14	0.15	100.63	-0.17	-50.13	50.31	50.03	0.28	177.654	
200.00	199.94	199.67	199.67	0.39	0.37	94.36	-0.80	-50.47	51.15	50.40	0.75	67.973	
300.00	299.69	299.42	299.41	0.76	0.73	106.85	-0.88	-51.09	52.83	51.36	1.47	35.880	
400.00	399.44	398.74	398.73	1.11	1.08	123.03	-1.05	-51.99	56.56	54.36	2.19	25.778	
500.00	499.38	498.33	498.30	1.46	1.44	53.35	-1.42	-54.07	59.45	56.55	2.90	20.503	
600.00	599.31	598.80	598.74	1.81	1.80	-6.89	-2.33	-55.89	57.51	53.91	3.61	15.950	
700.00	699.17	697.07	696.97	2.15	2.15	-6.18	-2.68	-58.83	55.06	50.76	4.29	12.823	
800.00	799.03	796.89	796.68	2.49	2.51	1.75	-2.42	-63.27	54.12	49.13	5.00	10.836	
878.84	877.80	876.27	875.99	2.77	2.80	-7.58	-3.52	-66.69	53.71	48.15	5.56	9.665	
900.00	898.95	897.12	896.82	2.84	2.87	-10.99	-3.93	-67.61	53.91	48.20	5.71	9.449	
1,000.00	998.89	997.35	996.91	3.19	3.23	-25.74	-5.37	-72.35	55.09	48.67	6.41	8.589	
1,100.00	1,098.82	1,098.76	1,098.30	3.54	3.59	-27.71	-5.69	-74.46	53.81	46.69	7.13	7.551	
1,200.00	1,198.77	1,199.00	1,198.54	3.89	3.95	-26.51	-5.60	-74.94	51.32	43.49	7.83	6.552	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

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Project: Eddy County, NM

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Offset Design Hermes Fee 23-28-30 - TB #3H - OH - MWD 164'-13873' PTB 13930'													Offset Site Error:	0.00 usft
Survey Program: 164-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
1,300.00	1,298.72	1,298.72	1,298.26	4.24	4.30	-26.97	-5.93	-75.60	49.14	40.60	8.54	5.753		
1,400.00	1,398.67	1,398.59	1,398.12	4.60	4.66	-29.56	-6.31	-76.72	47.55	38.30	9.25	5.139		
1,500.00	1,498.64	1,498.50	1,498.02	4.95	5.02	-20.93	-6.64	-77.94	46.72	36.75	9.96	4.689		
1,501.67	1,500.31	1,500.16	1,499.68	4.96	5.03	-20.58	-6.64	-77.96	46.72	36.74	9.98	4.683 CC		
1,600.00	1,598.64	1,598.53	1,598.05	5.30	5.38	72.39	-6.96	-79.26	47.32	36.64	10.68	4.432 ES		
1,700.00	1,698.64	1,698.71	1,698.22	5.65	5.74	90.73	-7.53	-80.33	48.40	37.02	11.38	4.252		
1,800.00	1,798.63	1,799.37	1,798.87	5.99	6.09	142.85	-8.25	-80.57	49.18	37.10	12.08	4.073		
1,900.00	1,898.59	1,900.34	1,899.81	6.33	6.43	149.05	-9.81	-79.07	49.94	37.20	12.75	3.918		
2,000.00	1,998.49	2,000.76	2,000.17	6.68	6.76	147.39	-11.93	-76.14	50.95	37.53	13.42	3.797		
2,100.00	2,098.34	2,101.21	2,100.51	7.02	7.10	144.82	-14.63	-72.23	51.72	37.63	14.10	3.669		
2,200.00	2,198.08	2,200.96	2,200.12	7.37	7.44	142.09	-18.03	-68.29	53.53	38.74	14.78	3.621		
2,300.00	2,297.74	2,301.07	2,300.07	7.72	7.78	142.47	-22.03	-64.22	55.88	40.41	15.47	3.612		
2,400.00	2,397.56	2,400.62	2,399.46	8.07	8.12	142.49	-26.11	-60.53	56.84	40.67	16.17	3.516		
2,500.00	2,497.50	2,500.28	2,499.00	8.42	8.47	147.50	-30.09	-57.56	56.68	39.81	16.87	3.361		
2,600.00	2,597.46	2,600.13	2,598.76	8.77	8.81	148.71	-33.58	-55.03	56.55	38.98	17.57	3.219		
2,656.29	2,653.74	2,656.45	2,655.03	8.96	9.01	149.23	-35.55	-53.59	56.50	38.54	17.96	3.146		
2,700.00	2,697.43	2,699.62	2,698.15	9.12	9.16	149.47	-37.25	-52.68	56.68	38.41	18.27	3.103		
2,800.00	2,797.40	2,798.20	2,796.61	9.47	9.51	112.78	-42.16	-51.93	58.58	39.62	18.97	3.088		
2,900.00	2,897.38	2,896.61	2,894.83	9.82	9.86	54.41	-48.00	-53.60	60.81	41.15	19.66	3.093		
3,000.00	2,997.32	2,995.51	2,993.49	10.17	10.22	25.18	-53.61	-57.55	63.62	43.27	20.35	3.126		
3,100.00	3,097.16	3,094.81	3,092.52	10.52	10.57	15.06	-58.23	-63.07	64.94	43.89	21.05	3.085		
3,200.00	3,196.93	3,194.15	3,191.57	10.87	10.93	11.85	-61.22	-70.10	65.95	44.21	21.74	3.033		
3,300.00	3,296.71	3,294.17	3,291.25	11.22	11.28	16.84	-63.73	-77.95	67.70	45.25	22.45	3.016 SF		
3,400.00	3,396.54	3,393.63	3,390.36	11.58	11.64	16.10	-66.08	-85.89	70.39	47.24	23.14	3.041		
3,500.00	3,496.39	3,492.30	3,488.58	11.93	11.99	16.07	-67.89	-95.15	74.74	50.93	23.82	3.138		
3,600.00	3,596.25	3,590.27	3,585.88	12.28	12.34	15.41	-69.57	-106.38	81.22	56.76	24.46	3.320		
3,700.00	3,696.11	3,689.08	3,683.81	12.63	12.69	15.99	-71.66	-119.34	89.52	64.38	25.14	3.561		
3,800.00	3,795.98	3,788.86	3,782.66	12.99	13.05	14.99	-74.16	-132.73	98.31	72.46	25.85	3.803		
3,900.00	3,895.85	3,885.54	3,878.24	13.34	13.40	17.58	-76.71	-147.03	108.40	81.94	26.47	4.096		
4,000.00	3,995.69	3,983.51	3,974.81	13.70	13.76	17.85	-79.53	-163.31	119.99	92.86	27.13	4.423		
4,100.00	4,095.37	4,082.20	4,071.95	14.06	14.12	23.20	-82.69	-180.49	130.32	102.51	27.81	4.686		
4,200.00	4,194.57	4,180.74	4,168.79	14.42	14.48	26.66	-86.21	-198.34	137.41	108.93	28.48	4.825		
4,300.00	4,293.41	4,280.27	4,266.47	14.78	14.85	27.66	-90.10	-217.01	143.01	113.82	29.18	4.900		
4,400.00	4,392.11	4,381.99	4,366.48	15.14	15.22	27.46	-93.60	-235.24	146.89	116.94	29.96	4.904		
4,500.00	4,490.66	4,482.89	4,465.86	15.50	15.60	29.84	-96.66	-252.42	149.03	118.33	30.70	4.854		
4,600.00	4,589.35	4,583.97	4,565.53	15.87	15.97	34.84	-100.29	-268.89	151.62	120.17	31.45	4.820		
4,700.00	4,688.20	4,686.05	4,666.32	16.23	16.35	37.27	-104.44	-284.51	154.58	122.35	32.23	4.796		
4,800.00	4,786.95	4,786.32	4,765.51	16.60	16.72	39.02	-108.70	-298.55	155.79	122.83	32.96	4.727		
4,900.00	4,885.57	4,886.40	4,864.41	16.97	17.10	41.66	-113.71	-313.00	156.97	123.28	33.69	4.659		
5,000.00	4,984.42	4,984.88	4,961.70	17.34	17.47	44.73	-119.09	-327.22	159.61	125.22	34.39	4.641		
5,100.00	5,083.26	5,084.15	5,059.55	17.71	17.84	44.83	-125.46	-342.75	163.47	128.37	35.10	4.657		
5,200.00	5,181.67	5,184.79	5,158.68	18.08	18.22	45.07	-132.80	-358.48	165.17	129.32	35.85	4.607		
5,300.00	5,279.83	5,286.84	5,259.33	18.45	18.60	46.96	-140.26	-373.56	165.14	128.51	36.63	4.509		
5,382.52	5,361.01	5,370.16	5,341.64	18.76	18.92	48.65	-146.25	-385.02	165.13	127.88	37.25	4.433		
5,400.00	5,378.21	5,387.79	5,359.06	18.83	18.98	49.01	-147.53	-387.40	165.10	127.72	37.38	4.417		
5,500.00	5,476.78	5,486.96	5,457.03	19.20	19.36	52.11	-154.84	-400.99	166.13	128.02	38.11	4.359		
5,600.00	5,575.59	5,587.08	5,555.91	19.58	19.74	55.66	-162.06	-414.87	168.98	130.13	38.86	4.349		
5,700.00	5,674.29	5,685.05	5,652.54	19.95	20.11	55.06	-169.49	-429.23	172.14	132.58	39.56	4.352		
5,800.00	5,773.07	5,786.28	5,752.38	20.32	20.49	55.11	-177.17	-444.08	175.56	135.24	40.32	4.354		
5,900.00	5,871.98	5,887.06	5,851.90	20.70	20.87	49.96	-184.61	-458.11	178.22	137.16	41.06	4.340		
6,000.00	5,971.06	5,985.82	5,949.58	21.07	21.25	44.45	-180.43	-471.48	180.29	138.51	41.78	4.316		

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Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
6,100.00	6,070.33	6,082.39	6,045.03	21.44	21.61	45.47	-194.67	-485.52	184.52	142.06	42.45	4.346		
6,200.00	6,169.81	6,179.21	6,140.44	21.81	21.98	44.36	-198.80	-501.44	192.14	149.03	43.11	4.457		
6,300.00	6,269.42	6,281.12	6,240.69	22.17	22.37	38.82	-203.87	-518.98	200.96	157.09	43.87	4.581		
6,400.00	6,369.26	6,385.38	6,343.67	22.53	22.76	43.73	-209.72	-534.20	209.46	164.81	44.65	4.691		
6,500.00	6,469.19	6,483.35	6,440.54	22.89	23.14	35.70	-215.22	-547.78	219.19	173.85	45.34	4.834		
6,600.00	6,569.16	6,585.25	6,541.18	23.24	23.52	-24.91	-221.28	-562.55	230.27	183.93	46.34	4.969		
6,700.00	6,669.13	6,684.88	6,639.82	23.57	23.90	-112.69	-227.29	-575.19	242.11	194.81	47.30	5.119		
6,800.00	6,769.05	6,777.39	6,731.26	23.90	24.25	-120.30	-232.94	-588.03	257.09	209.17	47.92	5.365		
6,900.00	6,869.02	6,872.19	6,824.59	24.24	24.61	-34.42	-239.36	-603.38	272.74	224.51	48.23	5.655		
7,000.00	6,968.88	6,977.37	6,928.15	24.59	25.02	-27.00	-247.00	-620.08	284.06	235.06	49.00	5.797		
7,100.00	7,068.71	7,081.17	7,030.69	24.94	25.41	-27.30	-255.10	-634.02	292.43	242.67	49.77	5.876		
7,200.00	7,168.64	7,183.84	7,132.29	25.29	25.80	1.22	-262.82	-646.54	301.36	251.05	50.31	5.990		
7,300.00	7,268.56	7,286.21	7,233.82	25.65	26.19	10.31	-268.72	-658.23	309.31	258.35	50.96	6.069		
7,400.00	7,368.44	7,402.46	7,349.60	26.00	26.61	5.22	-271.23	-668.19	313.17	261.39	51.79	6.047		
7,500.00	7,468.32	7,514.68	7,461.74	26.36	27.01	5.29	-272.33	-672.12	311.81	259.20	52.61	5.926		
7,600.00	7,568.27	7,616.11	7,563.12	26.72	27.36	3.10	-274.86	-673.63	310.42	256.92	53.50	5.803		
7,622.06	7,590.33	7,637.96	7,584.96	26.79	27.44	-3.72	-275.62	-673.93	310.39	256.71	53.68	5.782		
7,700.00	7,668.26	7,718.24	7,665.18	27.07	27.72	-44.57	-278.47	-674.87	310.84	256.59	54.26	5.729		
7,800.00	7,768.25	7,821.01	7,767.92	27.41	28.07	-49.54	-280.91	-675.12	310.18	255.25	54.93	5.647		
7,900.00	7,868.21	7,919.41	7,866.32	27.76	28.40	-46.77	-281.67	-675.24	308.74	253.18	55.56	5.557		
8,000.00	7,968.18	8,013.97	7,960.85	28.11	28.72	-15.48	-280.32	-676.73	307.91	251.66	56.25	5.474		
8,100.00	8,068.10	8,111.85	8,058.64	28.47	29.06	6.27	-277.55	-679.88	306.94	249.98	56.96	5.389		
8,171.14	8,139.20	8,184.17	8,130.90	28.72	29.31	17.81	-275.74	-682.22	306.82	249.34	57.48	5.338		
8,200.00	8,168.04	8,213.75	8,160.46	28.82	29.41	27.54	-275.14	-683.04	306.65	248.95	57.70	5.314		
8,300.00	8,268.04	8,318.90	8,263.56	29.17	29.76	131.41	-272.97	-685.28	308.08	249.59	58.49	5.267		
8,400.00	8,368.01	8,417.26	8,363.88	29.50	30.10	-155.88	-270.26	-686.90	311.40	252.32	59.08	5.271		
8,500.00	8,467.91	8,518.09	8,464.67	29.83	30.44	-161.53	-267.89	-688.24	316.64	256.89	59.75	5.300		
8,600.00	8,567.87	8,619.16	8,565.72	30.16	30.79	-146.66	-266.39	-689.43	320.12	259.71	60.41	5.299		
8,700.00	8,667.86	8,726.32	8,672.86	30.50	31.14	-20.54	-264.98	-688.73	318.88	257.84	61.04	5.224		
8,800.00	8,767.82	8,826.87	8,773.05	30.86	31.47	11.02	-257.20	-687.65	314.44	252.70	61.74	5.093		
8,900.00	8,867.75	8,926.12	8,869.55	31.21	31.78	14.18	-234.61	-685.86	308.83	246.33	62.50	4.942		
8,988.87	8,956.57	9,010.72	8,947.48	31.53	32.04	16.64	-201.92	-683.95	306.79	243.57	63.22	4.853		
9,000.00	8,967.70	9,018.61	8,954.47	31.57	32.06	16.82	-198.28	-683.68	307.06	243.76	63.30	4.851		
9,100.00	9,067.59	9,080.48	9,007.35	31.92	32.22	-48.46	-166.22	-683.21	314.66	251.25	63.41	4.962		
9,200.00	9,165.28	9,138.00	9,052.52	32.25	32.37	-58.74	-130.79	-685.87	330.71	268.39	62.31	5.307		
9,300.00	9,256.69	9,203.21	9,097.59	32.55	32.50	-56.23	-84.03	-691.13	350.45	289.68	60.77	5.767		
9,400.00	9,339.02	9,279.90	9,143.82	32.82	32.63	-58.31	-23.27	-697.97	375.14	315.44	59.70	6.284		
9,500.00	9,412.28	9,350.52	9,180.26	33.07	32.74	-53.75	36.85	-704.16	400.28	341.76	58.52	6.840		
9,600.00	9,475.83	9,429.60	9,213.81	33.30	32.85	-49.98	108.22	-709.49	421.47	363.83	57.65	7.311		
9,700.00	9,528.02	9,509.24	9,239.82	33.52	32.97	-46.81	183.41	-712.18	436.97	380.21	56.76	7.699		
9,800.00	9,566.91	9,584.77	9,258.34	33.72	33.08	-46.08	256.60	-712.61	447.90	391.84	56.06	7.989		
9,900.00	9,586.00	9,659.53	9,268.28	33.90	33.20	-45.06	330.65	-711.79	452.53	396.62	55.90	8.095		
10,000.00	9,592.50	9,744.18	9,272.05	34.06	33.33	-44.52	415.11	-707.83	450.51	394.63	55.88	8.062		
10,100.00	9,593.61	9,828.13	9,272.00	34.24	33.48	-44.14	498.98	-704.28	448.15	392.18	55.97	8.006		
10,200.00	9,592.44	9,924.57	9,270.23	34.44	33.68	-43.89	595.36	-701.48	447.05	390.81	56.24	7.949		
10,255.33	9,591.36	9,976.54	9,269.24	34.57	33.80	-43.84	647.31	-700.49	446.72	390.25	56.47	7.911		
10,300.00	9,590.25	10,018.48	9,268.18	34.67	33.90	-43.85	689.24	-699.84	446.93	390.25	56.68	7.885		
10,400.00	9,587.93	10,113.16	9,266.03	34.94	34.15	-44.07	783.89	-699.82	448.56	391.31	57.25	7.835		
10,500.00	9,585.03	10,217.33	9,265.00	35.22	34.45	-44.64	888.04	-701.38	450.16	392.13	58.03	7.757		
10,600.00	9,584.61	10,322.43	9,265.74	35.53	34.78	-44.95	993.12	-703.27	450.57	391.90	58.67	7.680		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - TB #3H - OH - MWD 164'-13873' PTB 13930'													Offset Site Error: 0.00 usft
Survey Program: 164-MWD+IFR1													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
10,700.00	9,587.83	10,424.29	9,268.82	35.87	35.14	-45.01	1,094.90	-705.48	451.19	391.84	59.25	7.615	
10,800.00	9,593.39	10,512.89	9,269.46	36.24	35.46	-44.77	1,183.47	-707.62	455.61	395.94	59.67	7.636	
10,900.00	9,599.18	10,613.77	9,269.13	36.63	35.85	-44.45	1,284.31	-710.68	461.71	401.60	60.11	7.681	
11,000.00	9,605.53	10,721.72	9,270.31	37.04	36.30	-44.02	1,392.22	-713.24	466.12	405.56	60.56	7.696	
11,100.00	9,608.73	10,827.03	9,271.46	37.47	36.75	-43.61	1,497.52	-714.03	466.30	405.26	61.04	7.639	
11,200.00	9,608.83	10,945.75	9,273.99	37.92	37.29	-43.04	1,616.18	-712.17	460.04	398.53	61.51	7.479	
11,300.00	9,607.99	11,047.14	9,275.64	38.39	37.76	-42.24	1,717.32	-705.51	449.98	388.18	61.80	7.281	
11,400.00	9,607.03	11,158.87	9,275.34	38.87	38.28	-41.20	1,828.47	-694.16	442.16	380.24	61.91	7.142	
11,500.00	9,606.27	11,274.06	9,280.05	39.37	38.85	-40.48	1,942.84	-681.45	431.33	369.14	62.19	6.936	
11,600.00	9,605.91	11,369.70	9,285.70	39.88	39.34	-39.94	2,037.77	-671.29	420.02	357.39	62.63	6.706	
11,700.00	9,606.51	11,460.21	9,291.30	40.41	39.82	-39.53	2,127.83	-664.28	410.58	347.45	63.13	6.503	
11,800.00	9,606.89	11,549.60	9,296.88	40.96	40.32	-39.33	2,216.97	-660.85	402.16	338.39	63.77	6.306	
11,900.00	9,606.60	11,640.30	9,301.48	41.53	40.84	-39.41	2,307.55	-659.34	395.28	330.71	64.57	6.122	
12,000.00	9,605.79	11,728.69	9,303.83	42.12	41.36	-39.39	2,395.90	-658.95	390.83	325.44	65.39	5.977	
12,072.87	9,606.31	11,792.23	9,303.91	42.56	41.74	-39.14	2,459.43	-659.38	389.95	324.11	65.84	5.922	
12,100.00	9,607.01	11,816.22	9,303.57	42.72	41.89	-38.97	2,483.42	-659.72	390.29	324.32	65.96	5.917	
12,200.00	9,606.47	11,919.81	9,302.59	43.35	42.52	-38.40	2,586.99	-661.55	387.72	321.26	66.46	5.834	
12,300.00	9,604.48	12,021.85	9,302.92	43.99	43.16	-38.29	2,689.01	-663.54	384.19	316.94	67.25	5.713	
12,400.00	9,603.05	12,118.90	9,303.62	44.63	43.79	-38.57	2,786.01	-666.38	382.98	314.69	68.29	5.608	
12,490.33	9,601.29	12,206.71	9,304.71	45.22	44.37	-39.16	2,873.74	-670.22	382.61	313.16	69.45	5.509	
12,500.00	9,600.74	12,215.46	9,304.78	45.28	44.43	-39.27	2,882.47	-670.63	382.43	312.82	69.61	5.494	
12,600.00	9,598.98	12,309.60	9,303.70	45.94	45.06	-39.75	2,976.52	-674.74	384.47	313.64	70.83	5.428	
12,700.00	9,597.23	12,412.49	9,302.25	46.61	45.76	-40.24	3,079.33	-678.38	386.74	314.70	72.03	5.369	
12,800.00	9,596.87	12,510.55	9,298.96	47.29	46.44	-40.14	3,177.31	-680.14	390.08	317.16	72.92	5.350	
12,900.00	9,594.66	12,610.69	9,296.33	47.98	47.15	-40.44	3,277.39	-682.61	392.59	318.52	74.06	5.301	
13,000.00	9,592.19	12,716.15	9,294.50	48.68	47.90	-41.10	3,382.77	-686.24	395.42	320.04	75.38	5.246	
13,100.00	9,589.47	12,820.67	9,295.75	49.38	48.66	-42.07	3,487.22	-689.64	395.97	319.06	76.92	5.148	
13,200.00	9,588.25	12,924.73	9,297.54	50.09	49.42	-43.25	3,591.21	-692.97	396.56	318.00	78.57	5.048	
13,300.00	9,585.67	13,022.05	9,299.43	50.81	50.14	-44.02	3,688.49	-695.27	398.02	318.06	79.96	4.978	
13,400.00	9,588.85	13,123.91	9,299.88	51.55	50.89	-43.93	3,790.33	-696.84	401.09	320.22	80.87	4.960	
13,500.00	9,595.16	13,222.17	9,299.64	52.30	51.62	-43.12	3,888.59	-697.23	404.57	323.16	81.41	4.970	
13,600.00	9,601.13	13,311.84	9,297.75	53.07	52.30	-42.02	3,978.23	-697.63	408.24	326.45	81.80	4.991	
13,700.00	9,602.97	13,405.72	9,293.77	53.84	53.03	-41.10	4,072.02	-698.80	410.32	328.08	82.24	4.989	
13,800.00	9,600.48	13,496.39	9,288.68	54.62	53.74	-40.58	4,162.52	-700.81	411.07	328.14	82.93	4.957	
13,900.00	9,595.53	13,594.59	9,282.01	55.42	54.52	-40.30	4,260.44	-704.07	411.81	328.04	83.78	4.916	
14,000.00	9,591.19	13,688.80	9,275.87	56.21	55.28	-40.14	4,354.36	-708.39	413.55	328.87	84.68	4.884	
14,100.00	9,587.29	13,791.02	9,268.44	57.02	56.11	-39.87	4,456.19	-713.26	416.40	330.80	85.60	4.865	
14,200.00	9,583.30	13,886.13	9,261.01	57.83	56.89	-39.56	4,550.91	-717.40	419.46	333.02	86.44	4.852	
14,203.00	9,583.18	13,889.12	9,260.75	57.85	56.92	-39.55	4,553.89	-717.53	419.57	333.10	86.47	4.852	

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - TB #3H - OH - Plan #4														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1														Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Warning									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.00	0.00	0.00	0.00	0.00	0.00	-89.92	0.07	-50.03	50.03						
100.00	99.99	100.01	99.99	0.14	0.13	100.91	0.07	-50.03	50.21	49.95	0.26	189.716			
200.00	199.94	200.06	199.94	0.39	0.49	95.38	0.07	-50.03	50.78	49.91	0.87	58.410			
300.00	299.69	300.31	299.69	0.76	0.85	108.12	0.07	-50.03	51.99	50.39	1.59	32.605			
400.00	399.44	400.56	399.44	1.11	1.21	124.79	0.07	-50.03	55.05	52.73	2.32	23.734			
500.00	499.38	500.62	499.38	1.46	1.57	56.17	0.07	-50.03	56.19	53.16	3.03	18.542			
600.00	599.31	600.69	599.31	1.81	1.93	-2.40	0.07	-50.03	52.87	49.14	3.73	14.162			
700.00	699.17	700.83	699.17	2.15	2.29	0.01	0.07	-50.03	47.64	43.21	4.43	10.747			
800.00	799.03	800.97	799.03	2.49	2.64	9.81	0.07	-50.03	42.40	37.27	5.14	8.256			
900.00	898.95	901.05	898.95	2.84	3.00	0.63	0.07	-50.03	38.36	32.52	5.84	6.567			
1,000.00	998.89	1,001.11	998.89	3.19	3.36	-11.13	0.07	-50.03	34.98	28.43	6.55	5.342			
1,100.00	1,098.82	1,101.18	1,098.82	3.54	3.72	-11.89	0.07	-50.03	31.37	24.11	7.26	4.321			
1,200.00	1,198.77	1,201.23	1,198.77	3.89	4.08	-10.44	0.07	-50.03	28.09	20.12	7.97	3.525			
1,300.00	1,298.72	1,301.28	1,298.72	4.24	4.44	-10.05	0.07	-50.03	24.98	16.30	8.68	2.878			
1,400.00	1,398.67	1,401.33	1,398.67	4.60	4.80	-11.84	0.07	-50.03	21.97	12.58	9.39	2.339			
1,500.00	1,498.64	1,501.36	1,498.64	4.95	5.16	-2.61	0.07	-50.03	19.68	9.58	10.11	1.948			
1,598.86	1,597.50	1,602.50	1,597.50	5.30	5.52	90.00	0.07	-50.03	18.96	8.15	10.82	1.753 CC			
1,600.00	1,598.64	1,601.36	1,598.64	5.30	5.51	91.83	0.07	-50.03	19.00	8.19	10.82	1.757			
1,700.00	1,698.64	1,701.36	1,698.64	5.65	5.87	111.82	0.07	-50.03	19.22	7.70	11.52	1.668 ES			
1,800.00	1,798.63	1,801.37	1,798.63	5.99	6.23	165.26	0.07	-50.03	19.97	7.74	12.22	1.633 SF			
1,900.00	1,898.59	1,901.41	1,898.59	6.33	6.59	172.83	0.07	-50.03	22.55	9.63	12.92	1.745			
2,000.00	1,998.49	2,001.51	1,998.49	6.68	6.95	172.29	0.07	-50.03	27.08	13.45	13.62	1.987			
2,100.00	2,098.34	2,101.66	2,098.34	7.02	7.31	170.88	0.07	-50.03	32.56	18.24	14.33	2.273			
2,200.00	2,198.08	2,201.92	2,198.08	7.37	7.67	169.24	0.07	-50.03	39.62	24.59	15.03	2.636			
2,300.00	2,297.74	2,302.26	2,297.74	7.72	8.03	170.41	0.07	-50.03	47.66	31.93	15.73	3.029			
2,400.00	2,397.56	2,402.44	2,397.56	8.07	8.39	171.89	0.07	-50.03	53.57	37.13	16.44	3.258			
2,500.00	2,497.50	2,502.50	2,497.50	8.42	8.74	179.22	0.07	-50.03	57.01	39.87	17.15	3.325			
2,600.00	2,597.46	2,597.46	2,597.46	8.77	9.08	-177.36	0.07	-50.03	59.62	41.78	17.83	3.343			
2,700.00	2,697.43	2,696.94	2,696.94	9.12	9.43	-174.67	-0.18	-50.60	62.60	44.07	18.53	3.378			
2,800.00	2,797.40	2,796.34	2,796.34	9.47	9.76	150.80	-0.89	-52.36	66.21	47.00	19.21	3.447			
2,900.00	2,897.38	2,895.74	2,895.67	9.82	10.10	95.26	-2.11	-55.32	69.02	49.13	19.89	3.470			
3,000.00	2,997.32	2,995.13	2,994.95	10.17	10.43	68.05	-3.82	-59.48	71.38	50.80	20.58	3.469			
3,100.00	3,097.16	3,094.52	3,094.17	10.52	10.77	59.33	-6.02	-64.82	72.52	51.25	21.26	3.411			
3,200.00	3,196.93	3,193.91	3,193.31	10.87	11.11	55.77	-8.72	-71.37	73.37	51.43	21.94	3.344			
3,300.00	3,296.71	3,293.28	3,292.32	11.22	11.45	59.04	-11.90	-79.10	75.09	52.47	22.63	3.319			
3,400.00	3,396.54	3,392.54	3,391.12	11.58	11.80	55.43	-15.57	-88.01	78.33	55.02	23.31	3.361			
3,500.00	3,496.39	3,491.67	3,489.64	11.93	12.14	51.39	-19.72	-98.09	82.63	58.65	23.98	3.445			
3,600.00	3,596.25	3,590.63	3,587.85	12.28	12.48	46.23	-24.35	-109.34	87.98	63.33	24.66	3.568			
3,700.00	3,696.11	3,689.38	3,685.69	12.63	12.83	42.46	-29.45	-121.73	94.55	69.23	25.32	3.734			
3,800.00	3,795.98	3,787.89	3,783.11	12.99	13.18	37.48	-35.02	-135.26	102.47	76.49	25.98	3.944			
3,900.00	3,895.85	3,886.14	3,880.07	13.34	13.53	36.32	-41.05	-149.90	111.73	85.09	26.63	4.195			
4,000.00	3,995.69	3,984.85	3,977.31	13.70	13.88	33.18	-47.53	-165.62	121.88	94.58	27.30	4.465			
4,100.00	4,095.37	4,084.39	4,075.33	14.06	14.09	35.88	-54.11	-181.60	130.63	102.79	27.84	4.692			
4,200.00	4,194.57	4,184.23	4,173.66	14.42	14.13	37.50	-60.71	-197.64	136.00	107.78	28.23	4.818			
4,300.00	4,293.41	4,284.17	4,272.08	14.78	14.16	37.10	-67.32	-213.68	139.33	110.73	28.60	4.872			
4,400.00	4,392.11	4,384.13	4,370.53	15.14	14.19	35.46	-73.92	-229.73	141.71	112.73	28.98	4.890			
4,500.00	4,490.66	4,484.11	4,468.99	15.50	14.24	36.38	-80.54	-245.79	143.10	113.72	29.37	4.871			
4,600.00	4,589.35	4,584.07	4,567.43	15.87	14.30	40.15	-87.14	-261.84	145.55	115.77	29.78	4.888			
4,700.00	4,688.20	4,683.99	4,665.83	16.23	14.37	41.48	-93.75	-277.88	149.27	119.07	30.20	4.943			
4,800.00	4,788.95	4,783.93	4,764.25	16.60	14.45	42.22	-100.36	-293.93	152.48	121.86	30.62	4.979			
4,900.00	4,885.57	4,883.86	4,862.66	16.97	14.54	44.18	-106.96	-309.97	155.25	124.19	31.06	4.998			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



Professional Directional
Anticollision Report



Company: Marathon Oil
Project: Eddy County, NM
Reference Site: Hermes Fee 23-28-30
Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - TB #3H - OH - Plan #4														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore +N/-S (usft)	Centre +E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)		
5,000.00	4,984.42	4,983.76	4,961.05	17.34	14.63	46.72	-113.57	-326.01	159.42	127.91	31.51	5.059			
5,100.00	5,083.26	5,083.65	5,059.42	17.71	14.74	46.68	-120.17	-342.05	163.72	131.75	31.97	5.121			
5,200.00	5,181.67	5,183.56	5,157.81	18.08	14.86	47.08	-126.78	-358.10	166.08	133.63	32.44	5.119			
5,300.00	5,279.83	5,283.46	5,256.19	18.45	14.99	49.07	-133.38	-374.14	167.60	134.67	32.93	5.090			
5,400.00	5,378.21	5,383.36	5,354.57	18.83	15.13	51.09	-139.99	-390.18	170.13	136.71	33.42	5.090			
5,500.00	5,476.78	5,483.25	5,452.95	19.20	15.27	54.20	-146.59	-406.22	173.74	139.81	33.83	5.120			
5,600.00	5,575.59	5,583.09	5,551.27	19.58	15.43	57.67	-153.20	-422.25	178.97	144.52	34.45	5.196			
5,700.00	5,674.29	5,682.94	5,649.60	19.95	15.59	57.15	-159.80	-438.28	183.83	148.87	34.96	5.258			
5,800.00	5,773.07	5,782.79	5,747.93	20.32	15.76	57.28	-166.40	-454.31	188.93	153.45	35.49	5.324			
5,900.00	5,871.98	5,882.66	5,846.28	20.70	15.94	52.12	-173.00	-470.35	193.91	157.91	36.00	5.386			
6,000.00	5,971.06	5,982.56	5,944.67	21.07	16.13	46.17	-179.61	-486.39	198.20	161.68	36.52	5.427			
6,100.00	6,070.33	6,082.40	6,042.99	21.44	16.32	46.43	-186.21	-502.42	203.24	166.20	37.05	5.486			
6,200.00	6,169.81	6,182.12	6,141.20	21.81	16.52	44.72	-192.80	-518.43	209.84	172.26	37.58	5.584			
6,300.00	6,269.42	6,281.74	6,239.30	22.17	16.73	38.93	-199.39	-534.43	217.08	178.97	38.11	5.696			
6,400.00	6,369.26	6,381.03	6,337.08	22.53	16.94	43.69	-205.95	-550.37	226.79	188.15	38.64	5.869			
6,500.00	6,469.19	6,480.08	6,434.63	22.89	17.16	35.42	-212.50	-566.28	238.49	199.32	39.17	6.089			
6,600.00	6,569.16	6,578.91	6,531.96	23.24	17.38	-25.15	-219.04	-582.15	251.04	211.01	40.02	6.272			
6,700.00	6,669.13	6,677.17	6,628.73	23.57	17.61	-112.87	-225.53	-597.92	266.19	225.28	40.90	6.508			
6,800.00	6,769.05	6,775.01	6,725.08	23.90	17.85	-120.54	-232.00	-613.63	283.32	241.84	41.48	6.830			
6,900.00	6,869.02	6,873.31	6,821.88	24.24	18.09	-34.50	-238.50	-629.42	298.89	257.28	41.60	7.184			
7,000.00	6,968.88	6,972.19	6,919.26	24.59	18.33	-26.66	-245.04	-645.29	310.35	268.26	42.09	7.373			
7,100.00	7,068.71	7,071.15	7,016.72	24.94	18.58	-26.49	-251.58	-661.18	321.28	278.64	42.64	7.535			
7,200.00	7,168.64	7,180.78	7,124.95	25.29	18.86	2.31	-258.20	-677.26	332.52	289.45	43.08	7.719			
7,300.00	7,268.56	7,292.81	7,236.16	25.65	19.14	11.60	-263.34	-689.75	340.05	296.34	43.70	7.781			
7,400.00	7,368.44	7,405.42	7,348.39	26.00	19.41	6.32	-266.84	-698.24	342.89	298.52	44.37	7.728			
7,500.00	7,468.32	7,518.15	7,461.01	26.36	19.67	6.29	-268.65	-702.64	342.03	296.96	45.07	7.589			
7,600.00	7,568.27	7,625.41	7,568.27	26.72	19.91	4.51	-268.93	-703.32	339.59	293.56	46.03	7.378			
7,700.00	7,668.26	7,725.40	7,668.26	27.07	20.12	-42.52	-268.93	-703.32	338.47	291.91	46.56	7.270			
7,800.00	7,768.25	7,825.39	7,768.25	27.41	20.34	-47.01	-268.93	-703.32	337.28	290.16	47.12	7.158			
7,900.00	7,868.21	7,925.36	7,868.21	27.76	20.54	-44.07	-268.93	-703.32	335.54	287.88	47.66	7.040			
8,000.00	7,968.18	8,025.32	7,968.18	28.11	20.62	-13.02	-268.93	-703.32	333.24	285.12	48.12	6.925			
8,100.00	8,068.10	8,125.24	8,068.10	28.47	20.63	8.20	-268.93	-703.32	329.39	280.90	48.49	6.793			
8,200.00	8,168.04	8,225.19	8,168.04	28.82	20.65	28.97	-268.93	-703.32	326.26	277.35	48.90	6.672			
8,287.42	8,255.46	8,312.60	8,255.46	29.12	20.66	90.00	-268.93	-703.32	325.54	276.23	49.31	6.602			
8,300.00	8,268.04	8,325.18	8,268.04	29.17	20.67	132.39	-268.93	-703.32	325.73	276.44	49.29	6.609			
8,400.00	8,368.01	8,425.15	8,368.01	29.50	20.69	-155.42	-268.93	-703.32	327.66	278.11	49.55	6.613			
8,500.00	8,467.91	8,525.05	8,467.91	29.83	20.73	-161.52	-268.93	-703.32	331.74	281.82	49.92	6.646			
8,600.00	8,567.87	8,625.02	8,567.87	30.16	20.76	-146.92	-268.93	-703.32	334.15	283.91	50.25	6.650			
8,700.00	8,667.86	8,725.00	8,667.86	30.50	20.81	-21.03	-268.93	-703.32	333.68	283.00	50.69	6.583			
8,800.00	8,767.82	8,826.64	8,769.47	30.86	20.86	9.32	-267.70	-703.32	330.70	279.60	51.10	6.472			
8,900.00	8,867.75	8,928.43	8,869.92	31.21	20.91	11.03	-252.08	-703.34	326.33	274.79	51.53	6.332			
9,000.00	8,967.70	9,021.72	8,958.24	31.57	20.97	12.09	-222.37	-703.37	323.91	271.85	52.05	6.223			
9,000.69	8,968.39	9,022.33	8,958.80	31.57	20.97	11.02	-222.13	-703.37	323.90	271.85	52.06	6.222			
9,100.00	9,067.59	9,104.90	9,032.02	31.92	21.01	-52.69	-184.10	-703.42	326.78	274.31	52.46	6.229			
9,200.00	9,165.28	9,183.70	9,096.10	32.25	21.06	-63.09	-138.36	-703.47	333.00	280.45	52.54	6.338			
9,300.00	9,256.69	9,260.67	9,152.08	32.55	21.11	-61.14	-85.61	-703.53	340.07	287.82	52.25	6.509			
9,400.00	9,339.02	9,335.86	9,199.45	32.82	21.16	-64.20	-27.29	-703.60	353.20	301.48	51.72	6.830			
9,500.00	9,412.28	9,408.76	9,237.71	33.07	21.20	-59.11	34.70	-703.67	369.00	317.95	51.04	7.229			
9,600.00	9,475.83	9,479.32	9,266.96	33.30	21.23	-55.08	98.86	-703.75	383.94	333.70	50.24	7.642			
9,700.00	9,528.02	9,550.00	9,288.15	33.52	21.27	-61.43	166.25	-703.83	397.17	347.73	49.44	8.033			

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company: Marathon Oil
Project: Eddy County, NM
Reference Site: Hermes Fee 23-28-30
Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - TB #3H - OH - Plan #4											Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1											Offset Well Error:	0.00 usft
Reference	Offset		Semi Major Axis		Distance		Minimum		Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
9,800.00	9,566.91	9,615.37	9,300.21	33.72	21.29	-50.00	230.45	-703.90	410.58	361.78	48.80	8.413
9,900.00	9,586.00	9,682.28	9,304.92	33.90	21.33	-48.14	297.17	-703.98	420.22	371.56	48.66	8.635
10,000.00	9,592.50	9,778.69	9,304.96	34.06	21.49	-47.36	393.58	-704.09	424.44	375.68	48.76	8.704
10,100.00	9,593.61	9,878.68	9,304.96	34.24	21.74	-47.22	493.56	-704.21	425.04	375.98	49.06	8.664
10,200.00	9,592.44	9,978.67	9,304.96	34.44	22.04	-47.41	593.55	-704.33	424.78	375.30	49.48	8.584
10,272.53	9,590.96	10,051.18	9,304.96	34.61	22.29	-47.63	666.06	-704.41	424.53	374.67	49.86	8.515
10,300.00	9,590.25	10,076.63	9,304.96	34.67	22.38	-47.76	693.51	-704.44	424.57	374.55	50.02	8.489
10,400.00	9,587.93	10,178.57	9,304.96	34.94	22.76	-48.23	793.45	-704.56	424.90	374.29	50.60	8.397
10,500.00	9,585.03	10,278.48	9,304.96	35.22	23.16	-48.77	893.37	-704.68	425.12	373.87	51.26	8.294
10,600.00	9,584.61	10,378.47	9,304.96	35.53	23.61	-48.83	993.35	-704.79	424.86	373.10	51.77	8.207
10,602.95	9,584.66	10,381.41	9,304.96	35.54	23.62	-48.82	996.29	-704.80	424.86	373.08	51.78	8.205
10,700.00	9,587.83	10,478.40	9,304.97	35.87	24.08	-48.40	1,093.28	-704.91	425.97	373.80	52.17	8.165
10,800.00	9,593.39	10,578.24	9,304.97	36.24	24.58	-47.80	1,193.13	-705.02	429.04	376.49	52.55	8.164
10,900.00	9,599.18	10,678.07	9,304.97	36.63	25.11	-47.19	1,292.96	-705.14	432.64	379.68	52.96	8.169
11,000.00	9,605.53	10,777.86	9,304.97	37.04	25.66	-46.43	1,392.74	-705.26	436.03	382.69	53.35	8.174
11,100.00	9,608.73	10,877.77	9,304.97	37.47	26.24	-45.85	1,492.65	-705.37	436.38	382.57	53.81	8.110
11,200.00	9,608.83	10,977.62	9,304.97	37.92	26.84	-45.34	1,592.50	-705.49	432.61	378.30	54.31	7.966
11,300.00	9,607.99	11,077.46	9,304.97	38.39	27.47	-44.94	1,692.34	-705.61	428.13	373.27	54.86	7.804
11,400.00	9,607.03	11,177.45	9,304.97	38.87	28.11	-44.97	1,792.33	-705.72	426.95	371.33	55.61	7.677
11,500.00	9,606.27	11,277.44	9,304.97	39.37	28.77	-45.07	1,892.33	-705.84	426.65	370.25	56.40	7.565
11,519.34	9,606.14	11,303.22	9,304.97	39.47	28.94	-45.10	1,911.67	-705.86	426.63	370.04	56.58	7.540
11,600.00	9,605.91	11,377.44	9,304.97	39.88	29.45	-45.17	1,992.32	-705.96	426.84	369.63	57.21	7.461
11,700.00	9,606.51	11,477.44	9,304.98	40.41	30.14	-45.09	2,092.32	-706.07	427.14	369.18	57.96	7.370
11,800.00	9,606.89	11,577.41	9,304.98	40.96	30.85	-44.84	2,192.29	-706.19	425.87	367.20	58.67	7.259
11,900.00	9,606.60	11,677.38	9,304.98	41.53	31.58	-44.64	2,292.26	-706.31	423.87	364.45	59.42	7.133
12,000.00	9,605.79	11,777.35	9,304.98	42.12	32.31	-44.49	2,392.23	-706.42	421.73	361.51	60.22	7.003
12,100.00	9,607.01	11,877.27	9,304.98	42.72	33.06	-43.99	2,492.16	-706.54	420.18	359.27	60.90	6.899
12,200.00	9,606.47	11,977.06	9,304.98	43.35	33.82	-43.46	2,591.95	-706.66	415.46	353.89	61.57	6.748
12,300.00	9,604.48	12,076.93	9,304.98	43.99	34.59	-43.21	2,691.81	-706.77	410.86	348.50	62.36	6.589
12,400.00	9,603.05	12,176.90	9,304.98	44.63	35.37	-43.14	2,791.78	-706.89	408.42	345.17	63.25	6.457
12,500.00	9,600.74	12,276.87	9,304.98	45.28	36.16	-43.28	2,891.75	-707.00	406.16	341.92	64.24	6.322
12,600.00	9,598.98	12,376.85	9,304.98	45.94	36.96	-43.41	2,991.73	-707.12	404.71	339.46	65.25	6.202
12,700.00	9,597.23	12,476.83	9,304.99	46.61	37.76	-43.63	3,091.72	-707.24	403.79	337.48	66.31	6.090
12,800.00	9,596.87	12,576.83	9,304.99	47.29	38.58	-43.67	3,191.71	-707.35	403.50	336.21	67.29	5.996
12,900.00	9,594.66	12,676.80	9,304.99	47.98	39.40	-43.99	3,291.68	-707.47	402.63	334.20	68.43	5.884
13,000.00	9,592.19	12,776.75	9,304.99	48.68	40.23	-44.41	3,391.64	-707.59	402.11	332.49	69.62	5.775
13,100.00	9,589.47	12,876.69	9,304.99	49.38	41.06	-44.89	3,491.57	-707.70	401.68	330.81	70.87	5.668
13,138.16	9,588.27	12,914.82	9,304.99	49.65	41.38	-45.12	3,529.70	-707.75	401.60	330.23	71.37	5.627
13,200.00	9,586.25	12,976.59	9,304.99	50.09	41.90	-45.52	3,591.47	-707.82	401.64	329.45	72.19	5.563
13,300.00	9,585.67	13,076.55	9,304.99	50.81	42.75	-45.86	3,691.43	-707.94	403.02	329.69	73.34	5.496
13,400.00	9,588.85	13,176.49	9,304.99	51.55	43.60	-45.56	3,791.37	-708.05	405.35	331.14	74.21	5.462
13,500.00	9,595.16	13,276.26	9,304.99	52.30	44.45	-44.72	3,891.15	-708.17	408.29	333.42	74.87	5.453
13,600.00	9,601.13	13,376.00	9,304.99	53.07	45.31	-43.69	3,990.89	-708.29	409.98	334.49	75.49	5.431
13,700.00	9,602.97	13,475.87	9,305.00	53.84	46.18	-43.04	4,090.75	-708.40	407.97	331.75	76.23	5.352
13,800.00	9,600.48	13,575.72	9,305.00	54.62	47.05	-42.92	4,190.60	-708.52	403.03	325.84	77.18	5.222
13,900.00	9,595.53	13,675.50	9,305.00	55.42	47.92	-42.95	4,290.39	-708.64	396.53	318.24	78.29	5.065
14,000.00	9,591.19	13,775.31	9,305.00	56.21	48.79	-42.89	4,390.20	-708.75	390.36	311.00	79.36	4.919
14,100.00	9,587.29	13,875.15	9,305.00	57.02	49.67	-42.82	4,490.03	-708.87	384.62	304.20	80.43	4.782
14,200.00	9,583.30	13,974.99	9,305.00	57.83	50.55	-42.78	4,589.87	-708.98	378.93	297.42	81.51	4.649
14,203.00	9,583.18	13,977.98	9,305.00	57.85	50.58	-42.78	4,592.86	-708.99	378.76	297.22	81.54	4.645

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - MWD 164'-14029' PTB 14081'													Offset Site Error:	0.00 usft
Survey Program: 164-MWD+IFR1													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	90.07	-0.06	50.02	50.02					
100.00	99.99	99.69	99.69	0.14	0.15	-81.27	-0.14	50.33	50.16	49.88	0.28	177.485	ES	
200.00	199.94	199.17	199.16	0.39	0.37	-93.75	-0.37	51.30	50.88	50.13	0.75	67.535		
300.00	299.69	298.23	298.20	0.76	0.73	-95.52	-0.56	53.51	53.86	52.38	1.48	36.461		
400.00	399.44	398.21	398.13	1.11	1.09	-91.94	-0.90	56.35	57.10	54.90	2.20	25.983		
500.00	499.38	498.78	498.68	1.46	1.45	-165.84	-1.14	58.21	59.76	56.85	2.91	20.524		
600.00	599.31	598.91	598.81	1.81	1.81	137.54	-2.00	59.44	63.58	59.97	3.61	17.595		
700.00	699.17	698.72	698.60	2.15	2.16	144.24	-3.11	60.42	68.26	63.95	4.31	15.844		
800.00	799.03	797.21	797.07	2.49	2.51	156.36	-4.12	62.47	74.75	69.75	5.01	14.928		
900.00	898.95	896.90	896.70	2.84	2.87	148.87	-5.07	65.57	81.34	75.62	5.71	14.240		
1,000.00	998.89	997.63	997.40	3.19	3.23	140.36	-6.54	67.88	86.17	79.75	6.42	13.419		
1,100.00	1,098.82	1,097.48	1,097.22	3.54	3.59	143.28	-7.91	69.81	90.70	83.57	7.13	12.722		
1,200.00	1,198.77	1,197.00	1,196.71	3.89	3.95	148.15	-9.30	71.61	95.44	87.60	7.84	12.176		
1,300.00	1,298.72	1,297.03	1,296.70	4.24	4.31	151.54	-10.86	73.77	100.35	91.80	8.55	11.735		
1,400.00	1,398.67	1,396.81	1,396.46	4.60	4.67	152.74	-12.36	75.66	105.01	95.74	9.26	11.336		
1,500.00	1,498.64	1,497.18	1,496.80	4.95	5.03	164.47	-14.03	77.60	109.16	99.18	9.98	10.939		
1,600.00	1,598.64	1,597.54	1,597.14	5.30	5.39	-101.30	-15.37	78.95	111.34	100.65	10.68	10.420		
1,700.00	1,698.64	1,697.66	1,697.25	5.65	5.75	-82.86	-16.46	80.15	112.55	101.16	11.39	9.881		
1,800.00	1,798.63	1,796.33	1,795.90	5.99	6.10	-30.70	-17.27	81.79	113.68	101.60	12.08	9.408		
1,900.00	1,898.59	1,894.61	1,894.33	6.33	6.45	-24.58	-18.08	84.75	114.40	101.62	12.77	8.957		
2,000.00	1,998.49	1,995.11	1,994.56	6.68	6.81	-27.26	-18.86	88.35	113.93	100.46	13.47	8.455		
2,100.00	2,098.34	2,094.66	2,094.04	7.02	7.17	-31.28	-19.65	91.92	112.72	98.55	14.17	7.953		
2,200.00	2,198.08	2,193.78	2,193.08	7.37	7.53	-36.42	-20.96	96.01	110.96	96.09	14.87	7.461		
2,300.00	2,297.74	2,293.25	2,292.40	7.72	7.89	-38.57	-23.28	100.78	109.31	93.73	15.58	7.018		
2,374.94	2,372.53	2,369.18	2,368.24	7.98	8.16	-39.00	-25.01	104.14	108.90	92.79	16.11	6.758		
2,400.00	2,397.56	2,394.63	2,393.66	8.07	8.25	-38.99	-25.52	105.10	108.91	92.62	16.29	6.684		
2,500.00	2,497.50	2,495.51	2,494.47	8.42	8.62	-32.06	-27.38	108.27	109.24	92.23	17.01	6.422		
2,600.00	2,597.46	2,595.34	2,594.25	8.77	8.98	-28.19	-29.19	110.98	109.63	91.91	17.72	6.188		
2,700.00	2,697.43	2,694.36	2,693.17	9.12	9.33	-24.06	-32.23	114.35	110.75	92.33	18.42	6.012		
2,800.00	2,797.40	2,793.54	2,792.17	9.47	9.69	-55.58	-36.47	118.48	112.84	93.72	19.12	5.901	SF	
2,900.00	2,897.38	2,893.09	2,891.44	9.82	10.05	-108.73	-42.39	123.07	117.86	98.02	19.84	5.941		
3,000.00	2,997.32	2,992.74	2,990.76	10.17	10.41	-133.88	-48.90	127.65	124.67	104.12	20.55	6.066		
3,100.00	3,097.16	3,092.55	3,090.26	10.52	10.77	-141.94	-55.36	132.25	134.19	112.92	21.28	6.310		
3,200.00	3,196.93	3,190.81	3,188.20	10.87	11.13	-144.91	-61.81	136.79	145.05	123.09	21.96	6.604		
3,300.00	3,296.71	3,289.44	3,286.43	11.22	11.49	-140.06	-68.86	142.20	156.79	134.13	22.67	6.917		
3,400.00	3,396.54	3,388.26	3,384.82	11.58	11.85	-141.02	-76.26	147.80	168.04	144.67	23.37	7.190		
3,500.00	3,496.39	3,487.27	3,483.31	11.93	12.21	-141.21	-84.58	153.53	179.41	155.33	24.08	7.451		
3,600.00	3,596.25	3,587.53	3,583.03	12.28	12.58	-142.05	-93.27	159.13	190.73	165.93	24.80	7.691		
3,700.00	3,696.11	3,683.70	3,678.66	12.63	12.93	-141.46	-101.62	164.87	202.50	177.02	25.48	7.948		
3,800.00	3,795.98	3,783.32	3,777.68	12.99	13.29	-142.06	-110.21	171.65	215.10	188.91	26.20	8.212		
3,900.00	3,895.85	3,882.85	3,876.63	13.34	13.66	-139.16	-118.75	178.17	227.54	200.63	26.91	8.455		
4,000.00	3,995.69	3,982.58	3,975.80	13.70	14.03	-138.68	-127.04	184.56	240.15	212.52	27.63	8.691		
4,100.00	4,095.37	4,077.66	4,070.27	14.06	14.38	-133.55	-135.47	191.30	255.03	226.72	28.30	9.010		
4,200.00	4,194.57	4,174.53	4,166.38	14.42	14.73	-131.67	-145.07	198.75	273.54	244.53	29.01	9.431		
4,300.00	4,293.41	4,270.90	4,261.90	14.78	15.09	-133.08	-155.09	206.59	294.31	264.60	29.71	9.907		
4,400.00	4,392.11	4,369.22	4,359.35	15.14	15.46	-135.87	-165.32	214.71	316.12	285.69	30.43	10.388		
4,500.00	4,490.66	4,469.15	4,458.44	15.50	15.83	-136.07	-175.74	222.38	338.39	307.22	31.17	10.856		
4,600.00	4,589.35	4,569.91	4,558.67	15.87	16.20	-133.52	-185.60	229.47	358.89	326.98	31.91	11.245		
4,700.00	4,688.20	4,671.65	4,659.60	16.23	16.58	-133.30	-194.65	235.86	377.30	344.63	32.66	11.551		
4,800.00	4,786.95	4,770.70	4,758.21	16.60	16.94	-133.88	-201.91	241.67	395.50	362.11	33.39	11.844		
4,900.00	4,885.57	4,865.75	4,852.84	16.97	17.29	-133.71	-208.55	247.68	414.55	380.46	34.09	12.160		

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Professional Directional Anticollision Report



Company: Marathon Oil
Project: Eddy County, NM
Reference Site: Hermes Fee 23-28-30
Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - MWD 164'-14029' PTB 14081'													Offset Site Error: 0.00 usft
Survey Program: 164-MWD+IFR1													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,984.42	4,960.34	4,946.97	17.34	17.64	-132.51	-214.97	254.48	433.22	398.44	34.79	12.454	
5,100.00	5,083.26	5,059.23	5,045.34	17.71	18.01	-133.81	-221.61	262.14	452.34	416.82	35.52	12.736	
5,200.00	5,181.67	5,158.34	5,144.00	18.08	18.37	-135.17	-227.91	269.18	472.84	436.59	36.25	13.043	
5,300.00	5,279.83	5,257.17	5,242.40	18.45	18.73	-135.84	-233.59	276.31	494.44	457.45	36.99	13.367	
5,400.00	5,378.21	5,357.19	5,342.07	18.83	19.10	-135.99	-238.78	282.98	514.61	476.89	37.73	13.641	
5,500.00	5,476.78	5,458.91	5,443.45	19.20	19.47	-134.75	-244.16	289.28	533.40	494.93	38.47	13.865	
5,600.00	5,575.59	5,558.81	5,543.07	19.58	19.84	-132.71	-249.05	294.85	549.97	510.77	39.21	14.028	
5,700.00	5,674.29	5,667.57	5,651.62	19.95	20.23	-134.87	-253.43	300.10	566.35	526.35	40.00	14.160	
5,800.00	5,773.07	5,776.27	5,760.22	20.32	20.62	-136.44	-256.51	303.28	580.57	539.81	40.77	14.241	
5,900.00	5,871.98	5,877.90	5,861.79	20.70	20.99	-142.73	-259.24	305.38	593.90	552.40	41.50	14.311	
6,000.00	5,971.06	5,991.68	5,975.55	21.07	21.38	-149.17	-261.33	305.61	605.54	563.38	42.16	14.362	
6,100.00	6,070.33	6,091.60	6,075.46	21.44	21.71	-148.78	-261.92	304.55	614.89	572.04	42.85	14.351	
6,200.00	6,169.81	6,187.05	6,170.91	21.81	22.02	-150.11	-261.62	304.19	623.20	579.74	43.46	14.340	
6,300.00	6,269.42	6,283.43	6,267.28	22.17	22.35	-155.08	-262.38	304.15	630.99	586.67	44.33	14.238	
6,400.00	6,369.26	6,377.03	6,360.88	22.53	22.68	-148.76	-263.39	304.91	636.85	591.81	45.04	14.140	
6,500.00	6,469.19	6,474.64	6,458.46	22.89	23.03	-155.42	-264.44	306.54	641.66	595.90	45.76	14.023	
6,600.00	6,569.16	6,579.51	6,563.32	23.24	23.40	-145.89	-265.87	307.96	645.26	598.74	46.52	13.872	
6,700.00	6,669.13	6,677.71	6,661.51	23.57	23.75	-60.45	-265.82	308.74	645.64	598.59	47.05	13.722	
6,800.00	6,769.05	6,774.83	6,758.62	23.90	24.09	-55.49	-265.16	310.21	645.04	597.35	47.69	13.524	
6,807.40	6,776.45	6,782.18	6,765.97	23.93	24.11	-59.12	-265.12	310.33	645.03	597.27	47.76	13.506	
6,900.00	6,869.02	6,875.18	6,858.96	24.24	24.43	-143.75	-264.65	311.84	646.63	598.15	48.48	13.338	
7,000.00	6,968.88	6,974.98	6,958.74	24.59	24.78	-153.39	-264.36	313.38	652.60	603.40	49.20	13.264	
7,100.00	7,068.71	7,084.87	7,068.63	24.94	25.16	-155.61	-264.20	314.41	658.81	608.93	49.88	13.208	
7,200.00	7,168.64	7,182.64	7,166.40	25.29	25.49	-174.08	-264.12	314.54	662.61	611.91	50.70	13.070	
7,300.00	7,268.56	7,274.74	7,258.49	25.65	25.81	-164.10	-264.46	315.37	667.31	615.96	51.35	12.996	
7,400.00	7,368.44	7,385.40	7,369.14	26.00	26.20	-169.07	-265.06	316.23	672.89	620.97	51.93	12.959	
7,500.00	7,468.32	7,496.29	7,480.03	26.36	26.57	-169.06	-264.48	314.92	676.46	623.85	52.61	12.858	
7,600.00	7,568.27	7,595.58	7,579.30	26.72	26.90	-170.96	-264.20	313.39	677.93	624.62	53.31	12.717	
7,700.00	7,668.26	7,701.54	7,685.23	27.07	27.24	-142.19	-264.98	311.22	677.04	622.95	54.09	12.516	
7,800.00	7,768.25	7,804.12	7,787.76	27.41	27.58	-138.10	-265.96	308.27	675.48	620.72	54.76	12.338	
7,900.00	7,868.21	7,902.21	7,885.82	27.76	27.90	-141.42	-265.01	305.58	674.61	619.25	55.37	12.184	
7,964.35	7,932.54	7,966.13	7,949.70	27.98	28.11	-163.28	-263.83	303.99	674.56	618.77	55.78	12.092	
8,000.00	7,968.18	8,002.47	7,986.03	28.11	28.23	-172.67	-263.24	303.07	674.50	618.48	56.02	12.041	
8,100.00	8,068.10	8,103.21	8,086.72	28.47	28.56	-166.25	-262.16	300.35	675.60	618.92	56.68	11.919	
8,200.00	8,168.04	8,199.58	8,183.06	28.82	28.87	-145.77	-261.66	297.88	676.07	618.67	57.40	11.777	
8,300.00	8,268.04	8,289.94	8,273.41	29.17	29.17	-42.56	-261.19	296.44	674.94	616.68	58.26	11.585	
8,400.00	8,368.01	8,382.25	8,365.72	29.50	29.48	-29.81	-260.93	296.32	672.94	614.27	58.67	11.470	
8,500.00	8,467.91	8,480.68	8,464.14	29.83	29.83	-24.24	-261.53	296.86	669.60	610.16	59.44	11.265	
8,600.00	8,567.87	8,583.22	8,566.67	30.16	30.19	-39.26	-263.28	297.23	667.71	607.53	60.18	11.095	
8,636.10	8,603.97	8,620.74	8,604.18	30.28	30.32	-91.85	-263.99	297.24	667.50	606.99	60.51	11.032	
8,700.00	8,667.86	8,687.62	8,671.05	30.50	30.55	-165.57	-265.17	297.03	668.16	607.31	60.85	10.981	
8,800.00	8,767.82	8,788.65	8,772.07	30.86	30.90	-164.17	-266.55	296.40	670.46	608.96	61.50	10.901	
8,900.00	8,867.75	8,890.02	8,873.43	31.21	31.25	-165.28	-267.48	295.58	673.20	611.03	62.18	10.827	
9,000.00	8,967.70	8,973.81	8,957.01	31.57	31.53	-170.17	-262.38	295.76	676.42	613.53	62.89	10.755	
9,100.00	9,067.59	9,037.27	9,019.58	31.92	31.74	-117.27	-252.32	298.52	684.00	620.69	63.31	10.804	
9,200.00	9,165.28	9,120.38	9,098.92	32.25	32.01	-97.98	-229.13	305.98	697.85	634.06	63.79	10.939	
9,300.00	9,266.69	9,231.27	9,195.22	32.55	32.33	-92.49	-175.41	314.33	711.76	647.28	64.48	11.039	
9,400.00	9,339.02	9,352.19	9,280.66	32.82	32.64	-82.45	-90.56	318.75	716.49	651.39	65.10	11.006	
9,418.94	9,353.52	9,371.95	9,292.44	32.87	32.68	-82.48	-74.69	318.90	716.46	651.28	65.18	10.992	
9,500.00	9,412.28	9,440.45	9,328.48	33.07	32.84	-82.43	-16.50	318.99	717.17	651.77	65.40	10.967	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - MWD 164'-14029' PTB 14081'														Offset Site Error:	0.00 usft
Survey Program: 164-MWD+IFR1														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)							
9,600.00	9,475.83	9,518.20	9,362.81	33.30	33.00	81.21	53.23	320.16	721.50	655.96	65.54	11.009			
9,700.00	9,528.02	9,621.86	9,399.48	33.52	33.21	80.17	150.12	321.05	727.35	661.56	65.79	11.055			
9,800.00	9,566.91	9,718.95	9,426.03	33.72	33.41	77.65	243.48	319.89	728.80	662.78	66.03	11.038			
9,900.00	9,586.00	9,789.75	9,438.28	33.90	33.55	78.15	313.15	319.22	726.28	660.07	66.21	10.969			
9,931.15	9,588.76	9,813.67	9,440.21	33.95	33.59	78.16	336.99	319.10	726.12	659.84	66.28	10.956			
10,000.00	9,592.50	9,876.69	9,441.64	34.06	33.71	78.02	399.99	318.66	726.42	659.99	66.43	10.935			
10,100.00	9,593.81	9,970.96	9,441.53	34.24	33.89	77.92	494.25	317.99	726.31	659.61	66.70	10.889			
10,200.00	9,592.44	10,069.78	9,440.21	34.44	34.11	77.90	593.06	318.17	725.92	658.90	67.02	10.831			
10,300.00	9,590.25	10,177.91	9,440.18	34.67	34.38	78.07	701.19	317.55	723.34	655.91	67.43	10.728			
10,400.00	9,587.93	10,265.21	9,441.69	34.94	34.62	78.30	788.48	317.37	719.99	652.14	67.85	10.612			
10,500.00	9,585.03	10,361.23	9,441.68	35.22	34.91	78.51	884.47	318.92	718.27	649.97	68.30	10.516			
10,541.53	9,584.26	10,407.33	9,442.77	35.35	35.05	78.63	930.56	319.60	717.90	649.38	68.52	10.477			
10,600.00	9,584.61	10,460.62	9,443.76	35.53	35.22	78.73	983.83	320.42	719.34	650.55	68.79	10.457			
10,700.00	9,587.83	10,567.13	9,444.35	35.87	35.59	78.60	1,090.33	321.85	722.65	653.38	69.27	10.432			
10,800.00	9,593.39	10,688.30	9,445.24	36.24	36.03	78.15	1,211.49	320.97	723.91	654.12	69.80	10.372			
10,900.00	9,599.18	10,831.32	9,449.23	36.63	36.63	77.69	1,354.19	312.78	719.16	648.72	70.43	10.210			
11,000.00	9,605.53	10,930.38	9,453.20	37.04	37.07	77.47	1,452.84	304.78	713.16	642.17	70.99	10.046			
11,100.00	9,608.73	11,031.60	9,459.44	37.47	37.55	77.78	1,553.62	297.63	708.26	636.59	71.67	9.882			
11,200.00	9,608.83	11,119.65	9,465.03	37.92	37.99	78.24	1,641.28	291.52	705.59	633.19	72.40	9.745			
11,300.00	9,607.99	11,216.35	9,468.79	38.39	38.48	78.62	1,737.76	286.25	704.77	631.58	73.19	9.629			
11,400.00	9,607.03	11,307.60	9,471.99	38.87	38.95	78.87	1,828.80	281.12	699.22	625.26	73.96	9.453			
11,500.00	9,606.27	11,394.68	9,472.93	39.37	39.41	78.94	1,915.81	277.65	694.73	620.05	74.68	9.303			
11,600.00	9,605.91	11,486.62	9,473.16	39.88	39.91	78.92	2,007.71	275.18	691.47	616.06	75.41	9.169			
11,678.46	9,606.23	11,556.43	9,472.61	40.30	40.29	78.84	2,077.51	273.83	690.39	614.44	75.96	9.089			
11,700.00	9,606.51	11,573.75	9,472.28	40.41	40.39	78.79	2,094.82	273.66	690.38	614.28	76.10	9.072			
11,800.00	9,606.89	11,662.09	9,469.27	40.96	40.89	78.56	2,183.11	273.94	693.63	616.83	76.80	9.031			
11,900.00	9,606.60	11,758.61	9,465.89	41.53	41.45	78.32	2,279.56	274.45	697.41	619.83	77.58	8.989			
12,000.00	9,605.79	11,846.37	9,463.88	42.12	41.96	78.32	2,367.27	276.70	702.49	624.14	78.36	8.965			
12,100.00	9,607.01	11,949.30	9,463.38	42.72	42.57	78.38	2,470.13	280.41	709.88	630.65	79.24	8.959			
12,200.00	9,606.47	12,059.56	9,466.46	43.35	43.24	78.61	2,580.30	283.60	718.27	637.99	80.28	8.947			
12,300.00	9,604.48	12,160.41	9,471.14	43.99	43.87	79.34	2,681.01	285.99	723.99	642.67	81.32	8.903			
12,400.00	9,603.05	12,261.23	9,476.26	44.63	44.52	79.93	2,781.67	288.53	727.41	645.04	82.37	8.831			
12,500.00	9,600.74	12,351.20	9,479.74	45.28	45.10	80.41	2,871.54	290.83	729.85	646.50	83.35	8.756			
12,600.00	9,598.98	12,434.62	9,478.63	45.94	45.65	80.50	2,954.88	293.93	733.82	649.60	84.21	8.714			
12,700.00	9,597.23	12,546.71	9,473.67	46.61	46.39	80.34	3,066.73	299.02	738.48	653.23	85.25	8.663			
12,800.00	9,596.87	12,649.48	9,473.16	47.29	47.08	80.37	3,169.47	301.74	741.25	654.99	86.26	8.593			
12,900.00	9,594.66	12,754.66	9,472.53	47.98	47.80	80.53	3,274.60	304.68	742.82	655.48	87.34	8.505			
13,000.00	9,592.19	12,848.99	9,471.39	48.68	48.46	80.63	3,368.89	307.03	743.42	655.08	88.34	8.415			
13,100.00	9,589.47	12,952.47	9,467.17	49.38	49.19	80.54	3,472.25	309.41	743.92	654.51	89.41	8.320			
13,200.00	9,586.25	13,067.13	9,461.65	50.09	50.03	80.36	3,586.77	310.31	741.97	651.41	90.56	8.193			
13,300.00	9,585.67	13,173.09	9,457.36	50.81	50.81	80.00	3,692.64	309.80	739.74	648.14	91.60	8.076			
13,340.76	9,586.52	13,215.00	9,455.72	51.11	51.13	79.81	3,734.52	309.43	739.49	647.48	92.00	8.038			
13,400.00	9,588.85	13,279.35	9,453.34	51.55	51.61	79.47	3,798.82	308.64	739.87	647.27	92.60	7.990			
13,500.00	9,595.16	13,383.84	9,450.04	52.30	52.40	78.80	3,903.24	306.43	741.80	648.21	93.59	7.926			
13,600.00	9,601.13	13,484.37	9,446.67	53.07	53.18	78.10	4,003.68	304.12	745.18	650.59	94.59	7.878			
13,700.00	9,602.97	13,588.55	9,443.50	53.84	53.98	77.70	4,107.78	301.41	748.52	652.83	95.69	7.822			
13,800.00	9,600.48	13,692.38	9,440.36	54.62	54.80	77.64	4,211.51	298.05	750.07	653.19	96.88	7.742			
13,900.00	9,595.53	13,798.53	9,437.62	55.42	55.64	77.85	4,317.55	294.05	750.13	651.98	98.15	7.643			
14,000.00	9,591.19	13,912.47	9,435.39	56.21	56.55	78.03	4,431.32	288.49	749.28	649.84	99.44	7.535			
14,100.00	9,587.29	14,035.95	9,435.24	57.02	57.56	78.32	4,554.45	279.16	745.29	644.53	100.76	7.397			
14,184.67	9,583.95	14,081.00	9,435.40	57.70	57.93	78.44	4,599.33	275.24	741.85	639.98	101.87	7.282			

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - MWD 164'-14029' PTB 14081'													Offset Site Error:	0.00 usft
Survey Program: 164-MWD+IFR1													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,200.00	9,583.30	14,081.00	9,435.40	57.83	57.93	78.44	4,599.33	275.24	742.00	639.99	102.01	7.274		
14,203.00	9,583.18	14,081.00	9,435.40	57.85	57.93	78.44	4,599.33	275.24	742.07	640.03	102.04	7.273		

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design														Hermes Fee 23-28-30 - WXY #5H - OH - Plan #4		Offset Site Error:		0.00 usft	
Survey Program:														0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1		Offset Well Error:		0.00 usft	
Reference		Offset		Semi Major Axis		Distance								Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor							
0.00	0.00	0.00	0.00	0.00	0.00	90.07	-0.06	50.02	50.02										
100.00	99.99	100.01	99.99	0.14	0.13	-81.38	-0.06	50.02	49.86	49.59	0.26	188.437							
180.69	180.64	180.64	180.64	0.34	0.42	-92.85	-0.06	50.02	49.80	49.05	0.75	66.209							
200.00	199.94	200.06	199.94	0.39	0.49	-94.26	-0.06	50.02	49.63	48.76	0.87	57.086 CC							
300.00	299.69	300.31	299.69	0.76	0.85	-96.97	-0.06	50.02	50.53	48.93	1.59	31.696							
400.00	399.44	400.56	399.44	1.11	1.21	-95.03	-0.06	50.02	51.37	49.05	2.32	22.164							
500.00	499.38	500.62	499.38	1.46	1.57	-169.96	-0.06	50.02	52.55	49.52	3.03	17.343							
600.00	599.31	600.69	599.31	1.81	1.93	132.78	-0.06	50.02	55.33	51.60	3.73	14.824							
700.00	699.17	700.83	699.17	2.15	2.29	139.10	-0.06	50.02	59.04	54.61	4.43	13.325							
800.00	799.03	800.97	799.03	2.49	2.64	150.85	-0.06	50.02	63.45	58.31	5.14	12.356							
900.00	898.95	901.05	898.95	2.84	3.00	142.90	-0.06	50.02	66.91	61.07	5.84	11.454							
1,000.00	998.89	1,001.11	998.89	3.19	3.36	133.78	-0.06	50.02	69.38	62.83	6.55	10.595							
1,100.00	1,098.82	1,101.18	1,098.82	3.54	3.72	136.37	-0.06	50.02	71.98	64.72	7.26	9.918							
1,200.00	1,198.77	1,201.23	1,198.77	3.89	4.08	140.93	-0.06	50.02	74.49	66.52	7.97	9.348							
1,300.00	1,298.72	1,301.28	1,298.72	4.24	4.44	143.93	-0.06	50.02	77.00	68.32	8.68	8.871							
1,400.00	1,398.67	1,401.33	1,398.67	4.60	4.80	144.84	-0.06	50.02	79.49	70.10	9.39	8.463							
1,500.00	1,498.64	1,501.36	1,498.64	4.95	5.16	156.11	-0.06	50.02	81.45	71.35	10.11	8.060							
1,600.00	1,598.64	1,601.36	1,598.64	5.30	5.51	-110.25	-0.06	50.02	82.19	71.37	10.82	7.598							
1,700.00	1,698.64	1,701.36	1,698.64	5.65	5.87	-92.43	-0.06	50.02	82.21	70.69	11.52	7.135							
1,800.00	1,798.63	1,801.37	1,798.63	5.99	6.23	-40.79	-0.06	50.02	81.73	69.50	12.22	6.686							
1,900.00	1,898.59	1,901.41	1,898.59	6.33	6.59	-35.51	-0.06	50.02	79.63	66.70	12.92	6.161							
2,000.00	1,998.49	2,001.51	1,998.49	6.68	6.95	-39.50	-0.06	50.02	76.01	62.38	13.62	5.579							
2,100.00	2,098.34	2,101.66	2,098.34	7.02	7.31	-45.34	-0.06	50.02	71.90	57.58	14.33	5.019							
2,200.00	2,198.08	2,201.92	2,198.08	7.37	7.67	-53.57	-0.06	50.02	67.28	52.24	15.03	4.475							
2,300.00	2,297.74	2,302.26	2,297.74	7.72	8.03	-60.33	-0.06	50.02	62.81	47.07	15.74	3.990							
2,400.00	2,397.56	2,402.44	2,397.56	8.07	8.39	-64.83	-0.06	50.02	60.07	43.62	16.45	3.652							
2,500.00	2,497.50	2,502.50	2,497.50	8.42	8.74	-60.81	-0.06	50.02	58.52	41.36	17.16	3.411							
2,600.00	2,597.46	2,597.46	2,597.46	8.77	9.08	-59.44	-0.06	50.02	57.14	39.29	17.85	3.201							
2,700.00	2,697.43	2,697.32	2,697.31	9.12	9.43	-57.94	-0.52	50.44	56.00	37.46	18.54	3.020							
2,789.67	2,787.08	2,788.88	2,786.86	9.43	9.72	-86.67	-1.74	51.57	55.58	36.42	19.15	2.902							
2,800.00	2,797.40	2,797.20	2,797.18	9.47	9.76	-91.27	-1.93	51.74	55.12	35.90	19.22	2.868 ES							
2,900.00	2,897.38	2,897.04	2,896.97	9.82	10.09	-144.61	-4.31	53.93	56.93	37.03	19.90	2.860 SF							
3,000.00	2,997.32	2,996.75	2,996.57	10.17	10.42	-168.30	-7.64	56.99	60.78	40.19	20.59	2.952							
3,100.00	3,097.16	3,096.14	3,095.79	10.52	10.75	-173.15	-11.92	60.92	67.95	46.68	21.27	3.195							
3,200.00	3,196.93	3,195.22	3,194.61	10.87	11.08	-172.31	-17.12	65.70	77.19	55.24	21.94	3.517							
3,300.00	3,296.71	3,294.05	3,293.10	11.22	11.42	-163.92	-23.26	71.34	87.27	64.65	22.62	3.858							
3,400.00	3,396.54	3,392.71	3,391.29	11.58	11.75	-161.71	-30.31	77.83	97.63	74.33	23.29	4.191							
3,500.00	3,496.39	3,491.09	3,489.07	11.93	12.09	-159.11	-38.28	85.15	108.77	84.81	23.96	4.539							
3,600.00	3,596.25	3,589.12	3,586.36	12.28	12.43	-157.39	-47.14	93.29	121.13	96.51	24.63	4.919							
3,700.00	3,696.11	3,686.79	3,683.13	12.63	12.76	-154.33	-56.88	102.24	134.76	109.47	25.29	5.329							
3,800.00	3,795.98	3,784.06	3,779.32	12.99	13.10	-152.63	-67.49	111.99	149.65	123.71	25.94	5.769							
3,900.00	3,895.85	3,880.90	3,874.91	13.34	13.44	-147.65	-78.94	122.51	165.96	139.37	26.59	6.241							
4,000.00	3,995.69	3,978.08	3,970.64	13.70	13.78	-145.25	-91.23	133.81	183.84	156.59	27.25	6.746							
4,100.00	4,095.37	4,075.90	4,066.97	14.06	14.00	-138.61	-103.74	145.31	203.79	175.99	27.81	7.329							
4,200.00	4,194.57	4,173.18	4,162.77	14.42	14.06	-135.82	-116.18	156.74	226.87	198.66	28.21	8.043							
4,300.00	4,293.41	4,270.03	4,258.16	14.78	14.08	-136.61	-128.56	168.12	251.75	223.17	28.58	8.809							
4,400.00	4,392.11	4,366.65	4,353.31	15.14	14.11	-138.87	-140.91	179.47	277.53	248.57	28.96	9.583							
4,500.00	4,490.66	4,463.00	4,448.20	15.50	14.16	-138.61	-153.23	190.79	304.27	274.92	29.35	10.366							
4,600.00	4,589.35	4,559.64	4,543.36	15.87	14.21	-135.56	-165.59	202.15	329.99	300.24	29.75	11.091							
4,700.00	4,688.20	4,656.58	4,638.83	16.23	14.27	-134.80	-177.98	213.54	354.52	324.35	30.17	11.752							
4,800.00	4,786.95	4,753.40	4,734.18	16.60	14.35	-134.64	-190.36	224.92	379.52	348.93	30.59	12.406							

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation



Professional Directional Anticollision Report



Company: Marathon Oil
Project: Eddy County, NM
Reference Site: Hermes Fee 23-28-30
Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - Plan #4											Offset Site Error: 0.00 usft	
Survey Program: 0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1											Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)				Between Centres (usft)
4,900.00	4,885.57	4,850.11	4,829.42	16.97	14.43	-133.84	-202.73	236.28	404.94	373.92	31.03	13.052
5,000.00	4,984.42	4,951.20	4,929.05	17.34	14.53	-132.03	-215.36	247.89	428.76	397.25	31.51	13.608
5,100.00	5,083.26	5,054.99	5,031.61	17.71	14.64	-132.83	-227.05	258.64	451.14	419.12	32.02	14.089
5,200.00	5,181.67	5,158.85	5,134.52	18.08	14.75	-133.83	-237.38	268.13	474.08	441.54	32.54	14.569
5,300.00	5,279.83	5,263.00	5,237.95	18.45	14.87	-134.29	-246.36	276.38	496.60	463.54	33.06	15.020
5,400.00	5,378.21	5,367.91	5,342.34	18.83	15.00	-134.31	-254.00	283.41	516.88	483.29	33.59	15.389
5,500.00	5,476.78	5,473.49	5,447.58	19.20	15.14	-133.07	-260.27	289.17	534.82	500.70	34.12	15.676
5,600.00	5,575.59	5,579.72	5,553.60	19.58	15.28	-131.14	-265.14	293.64	549.80	515.16	34.65	15.869
5,700.00	5,674.29	5,686.06	5,659.84	19.95	15.43	-133.41	-268.56	296.78	564.02	528.84	35.18	16.032
5,800.00	5,773.07	5,792.63	5,766.37	20.32	15.58	-135.08	-270.53	298.59	576.75	541.03	35.72	16.147
5,900.00	5,871.98	5,901.76	5,871.98	20.70	15.73	-141.64	-271.06	299.08	588.16	551.85	36.30	16.201
6,000.00	5,971.06	6,002.68	5,971.06	21.07	15.88	-148.18	-271.06	299.08	599.43	562.63	36.79	16.291
6,100.00	6,070.33	6,103.41	6,070.33	21.44	16.02	-147.88	-271.06	299.08	609.70	572.39	37.31	16.342
6,200.00	6,169.81	6,203.93	6,169.81	21.81	16.18	-149.22	-271.06	299.08	618.32	580.50	37.83	16.347
6,300.00	6,269.42	6,304.32	6,269.42	22.17	16.34	-154.28	-271.06	299.08	626.08	587.75	38.33	16.332
6,400.00	6,369.26	6,404.48	6,369.26	22.53	16.51	-148.08	-271.06	299.08	631.08	592.20	38.88	16.233
6,500.00	6,469.19	6,504.55	6,469.19	22.89	16.68	-154.83	-271.06	299.08	634.20	594.81	39.39	16.102
6,600.00	6,569.16	6,604.58	6,569.16	23.24	16.86	-146.37	-271.06	299.08	636.43	596.57	39.85	15.969
6,700.00	6,669.13	6,704.61	6,669.13	23.57	17.04	-60.96	-271.06	299.08	636.03	595.74	40.28	15.789
6,800.00	6,769.05	6,804.69	6,769.05	23.90	17.23	-56.07	-271.06	299.08	633.95	593.15	40.80	15.538
6,846.67	6,815.71	6,841.97	6,815.71	24.06	17.30	90.36	-271.06	299.08	633.51	592.48	41.03	15.442
6,900.00	6,869.02	6,904.72	6,869.02	24.24	17.43	144.36	-271.06	299.08	633.95	592.53	41.42	15.306
7,000.00	6,968.88	7,004.86	6,968.88	24.59	17.63	154.05	-271.06	299.08	638.41	596.43	41.98	15.209
7,100.00	7,068.71	7,105.03	7,068.71	24.94	17.83	156.26	-271.06	299.08	643.70	601.17	42.53	15.135
7,200.00	7,168.64	7,205.10	7,168.64	25.29	18.04	-173.43	-271.06	299.08	647.39	604.27	43.11	15.017
7,300.00	7,268.56	7,305.18	7,268.56	25.65	18.26	-163.50	-271.06	299.08	651.16	607.47	43.69	14.904
7,400.00	7,368.44	7,405.30	7,368.44	26.00	18.48	-168.50	-271.06	299.08	655.93	611.67	44.26	14.820
7,500.00	7,468.32	7,505.42	7,468.32	26.36	18.70	-168.45	-271.06	299.08	660.71	615.87	44.84	14.735
7,600.00	7,568.27	7,605.47	7,568.27	26.72	18.93	-170.34	-271.06	299.08	663.72	618.30	45.42	14.613
7,700.00	7,668.26	7,705.48	7,668.26	27.07	19.16	142.72	-271.06	299.08	664.87	618.90	45.97	14.464
7,800.00	7,768.25	7,805.49	7,768.25	27.41	19.39	138.54	-271.06	299.08	666.17	619.62	46.55	14.312
7,900.00	7,868.21	7,905.53	7,868.21	27.76	19.63	141.93	-271.06	299.08	668.08	620.96	47.13	14.176
8,000.00	7,968.18	8,005.56	7,968.18	28.11	19.74	173.34	-271.06	299.08	670.53	622.91	47.62	14.081
8,100.00	8,068.10	8,105.64	8,068.10	28.47	19.75	-165.48	-271.06	299.08	674.36	626.37	47.99	14.052
8,200.00	8,168.04	8,205.70	8,168.04	28.82	19.76	-144.96	-271.06	299.08	677.38	628.98	48.40	13.995
8,300.00	8,268.04	8,305.70	8,268.04	29.17	19.78	-41.72	-271.06	299.08	677.83	629.05	48.78	13.895
8,400.00	8,368.01	8,405.73	8,368.01	29.50	19.81	30.67	-271.06	299.08	675.99	626.95	49.04	13.784
8,500.00	8,467.91	8,505.83	8,467.91	29.83	19.84	25.05	-271.06	299.08	672.12	622.70	49.42	13.601
8,600.00	8,567.87	8,605.87	8,567.87	30.16	19.88	39.92	-271.06	299.08	669.84	620.09	49.75	13.464
8,635.04	8,602.91	8,629.17	8,602.91	30.28	19.89	90.00	-271.06	299.08	669.60	619.80	49.80	13.446
8,700.00	8,667.86	8,705.88	8,667.86	30.50	19.93	166.06	-271.06	299.08	670.42	620.24	50.19	13.358
8,800.00	8,767.82	8,805.92	8,767.82	30.86	19.98	-163.79	-271.06	299.08	673.31	622.70	50.61	13.303
8,900.00	8,867.75	8,905.99	8,867.75	31.21	20.04	-164.98	-271.06	299.08	676.81	625.79	51.03	13.264
9,000.00	8,967.70	8,995.30	8,969.03	31.57	20.09	-169.50	-270.42	299.08	679.92	628.49	51.44	13.219
9,100.00	9,067.59	9,098.80	9,071.42	31.92	20.16	117.94	-256.25	298.04	682.92	631.12	51.80	13.183
9,200.00	9,165.28	9,199.82	9,167.30	32.25	20.23	99.44	-224.90	298.95	687.64	635.45	52.19	13.176
9,300.00	9,256.69	9,299.50	9,255.10	32.55	20.31	94.99	-177.95	298.83	693.58	641.00	52.58	13.192
9,400.00	9,339.02	9,398.19	9,332.70	32.82	20.38	86.72	-117.19	298.66	693.23	640.29	52.94	13.095
9,500.00	9,412.28	9,495.52	9,397.93	33.07	20.46	87.95	-45.10	298.46	690.79	637.50	53.29	12.963
9,570.37	9,458.53	9,562.70	9,435.39	33.23	20.51	87.71	10.62	298.31	690.66	637.15	53.51	12.907

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - Plan #4														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						Between Centres (usft)
9,600.00	9,475.83	9,590.73	9,449.05	33.30	20.53	87.58	35.09	298.24	690.56	636.96	53.61	12.882		
9,700.00	9,528.02	9,683.60	9,485.46	33.52	20.59	87.15	120.42	298.01	692.90	639.01	53.89	12.858		
9,800.00	9,566.91	9,774.02	9,507.22	33.72	20.71	84.42	208.08	297.77	694.05	639.92	54.14	12.820		
9,893.14	9,586.56	9,856.83	9,514.84	33.88	20.86	84.03	290.47	297.55	693.15	638.82	54.34	12.757		
9,900.00	9,586.06	9,863.06	9,514.93	33.90	20.87	84.10	296.69	297.53	692.82	638.46	54.36	12.745		
10,000.00	9,592.50	9,960.81	9,513.42	34.06	21.10	83.47	394.43	297.26	693.68	639.06	54.61	12.701		
10,100.00	9,593.61	10,060.76	9,511.67	34.24	21.36	83.22	494.37	296.99	694.06	639.13	54.93	12.635		
10,200.00	9,592.44	10,160.76	9,509.92	34.44	21.67	83.17	594.35	296.72	693.25	637.95	55.30	12.536		
10,300.00	9,590.25	10,260.74	9,508.17	34.67	22.01	83.22	694.31	296.45	691.35	635.62	55.73	12.405		
10,400.00	9,587.93	10,360.70	9,506.42	34.94	22.39	83.23	794.26	296.17	688.60	632.41	56.20	12.254		
10,500.00	9,585.03	10,460.64	9,504.67	35.22	22.81	83.31	894.19	295.90	685.47	628.76	56.71	12.088		
10,559.67	9,584.16	10,520.30	9,503.62	35.41	23.07	83.24	953.84	295.74	684.64	627.62	57.02	12.007		
10,600.00	9,584.61	10,560.62	9,502.91	35.53	23.26	83.17	994.15	295.63	685.45	628.22	57.23	11.977		
10,700.00	9,587.83	10,660.48	9,501.16	35.87	23.74	82.79	1,093.99	295.36	687.26	629.47	57.78	11.894		
10,800.00	9,593.39	10,760.21	9,499.42	36.24	24.24	82.20	1,193.71	295.08	688.91	630.56	58.36	11.805		
10,900.00	9,599.18	10,859.93	9,497.67	36.63	24.78	81.59	1,293.41	294.81	690.25	631.29	58.96	11.708		
11,000.00	9,605.53	10,959.59	9,495.92	37.04	25.34	80.96	1,393.05	294.54	692.63	633.06	59.58	11.626		
11,100.00	9,608.73	11,059.43	9,494.17	37.47	25.93	80.55	1,492.88	294.27	695.82	635.57	60.25	11.548		
11,200.00	9,608.83	11,159.27	9,492.42	37.92	26.54	80.41	1,592.71	294.00	701.29	640.29	61.00	11.497		
11,300.00	9,607.99	11,259.12	9,490.68	38.39	27.17	80.42	1,692.54	293.72	706.69	644.89	61.79	11.436		
11,400.00	9,607.03	11,359.11	9,488.92	38.87	27.82	80.39	1,792.51	293.45	707.37	644.76	62.62	11.297		
11,500.00	9,606.27	11,459.10	9,487.17	39.37	28.49	80.30	1,892.49	293.18	707.05	643.60	63.45	11.144		
11,600.00	9,605.91	11,559.09	9,485.42	39.88	29.18	80.18	1,992.46	292.90	706.51	642.22	64.30	10.988		
11,620.18	9,606.00	11,579.26	9,485.07	39.99	29.32	80.14	2,012.63	292.85	706.47	642.00	64.47	10.959		
11,700.00	9,606.51	11,659.06	9,483.67	40.41	29.88	79.99	2,092.42	292.63	706.93	641.78	65.15	10.851		
11,800.00	9,606.89	11,759.02	9,481.92	40.96	30.60	79.86	2,192.38	292.36	709.29	643.25	66.04	10.740		
11,900.00	9,606.60	11,858.98	9,480.16	41.53	31.33	79.75	2,292.30	292.09	711.90	644.92	66.98	10.629		
12,000.00	9,605.79	11,958.95	9,478.41	42.12	32.08	79.72	2,392.26	291.81	714.12	646.17	67.94	10.511		
12,100.00	9,607.01	12,058.85	9,476.66	42.72	32.83	79.58	2,492.14	291.54	717.90	649.00	68.90	10.419		
12,200.00	9,606.47	12,158.64	9,474.91	43.35	33.60	79.42	2,591.91	291.27	724.12	654.19	69.93	10.355		
12,300.00	9,604.48	12,258.53	9,473.16	43.99	34.38	79.58	2,691.79	291.00	728.45	657.46	70.99	10.261		
12,400.00	9,603.05	12,358.51	9,471.41	44.63	35.16	79.60	2,791.76	290.72	730.36	658.30	72.05	10.136		
12,500.00	9,600.74	12,458.51	9,469.66	45.28	35.96	79.66	2,891.74	290.45	730.94	657.80	73.14	9.994		
12,600.00	9,598.98	12,558.51	9,467.91	45.94	36.77	79.67	2,991.72	290.18	731.03	656.79	74.23	9.848		
12,700.00	9,597.23	12,658.50	9,466.15	46.61	37.58	79.66	3,091.70	289.91	730.37	655.03	75.33	9.695		
12,763.53	9,596.55	12,722.03	9,465.04	47.04	38.10	79.63	3,155.21	289.73	730.15	654.12	76.04	9.603		
12,800.00	9,596.87	12,758.49	9,464.40	47.29	38.40	79.55	3,191.67	289.63	730.51	654.08	76.43	9.558		
12,900.00	9,594.66	12,858.48	9,462.65	47.98	39.23	79.59	3,291.65	289.36	729.23	651.65	77.58	9.400		
13,000.00	9,592.19	12,958.46	9,460.90	48.68	40.07	79.62	3,391.61	289.09	727.19	648.45	78.73	9.236		
13,100.00	9,589.47	13,058.43	9,459.15	49.38	40.91	79.69	3,491.56	288.81	724.75	644.84	79.91	9.069		
13,200.00	9,586.25	13,158.36	9,457.40	50.09	41.75	79.74	3,591.48	288.54	721.25	640.15	81.10	8.893		
13,300.00	9,585.67	13,258.31	9,455.64	50.81	42.60	79.57	3,691.42	288.27	718.85	636.62	82.23	8.742		
13,330.68	9,586.26	13,288.97	9,455.11	51.04	42.87	79.48	3,722.07	288.19	718.69	636.12	82.57	8.704		
13,400.00	9,588.85	13,358.18	9,453.89	51.55	43.46	79.24	3,791.27	288.00	719.45	636.13	83.32	8.635		
13,500.00	9,595.16	13,457.83	9,452.15	52.30	44.32	78.74	3,890.90	287.73	722.95	638.54	84.42	8.564		
13,600.00	9,601.13	13,557.46	9,450.40	53.07	45.18	78.14	3,990.52	287.45	728.00	642.45	85.54	8.510		
13,700.00	9,602.97	13,657.28	9,448.65	53.84	46.05	77.85	4,090.32	287.18	733.34	646.60	86.74	8.454		
13,800.00	9,600.48	13,757.17	9,446.90	54.62	46.93	77.86	4,190.19	286.91	737.52	649.49	88.03	8.378		
13,900.00	9,595.53	13,857.03	9,445.15	55.42	47.80	78.18	4,290.04	286.64	740.83	651.46	89.37	8.290		
14,000.00	9,591.19	13,956.91	9,443.40	56.21	48.68	78.44	4,389.90	286.36	744.46	653.75	90.71	8.207		
14,100.00	9,587.29	14,056.80	9,441.65	57.02	49.57	78.68	4,489.78	286.09	748.04	655.99	92.05	8.127		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

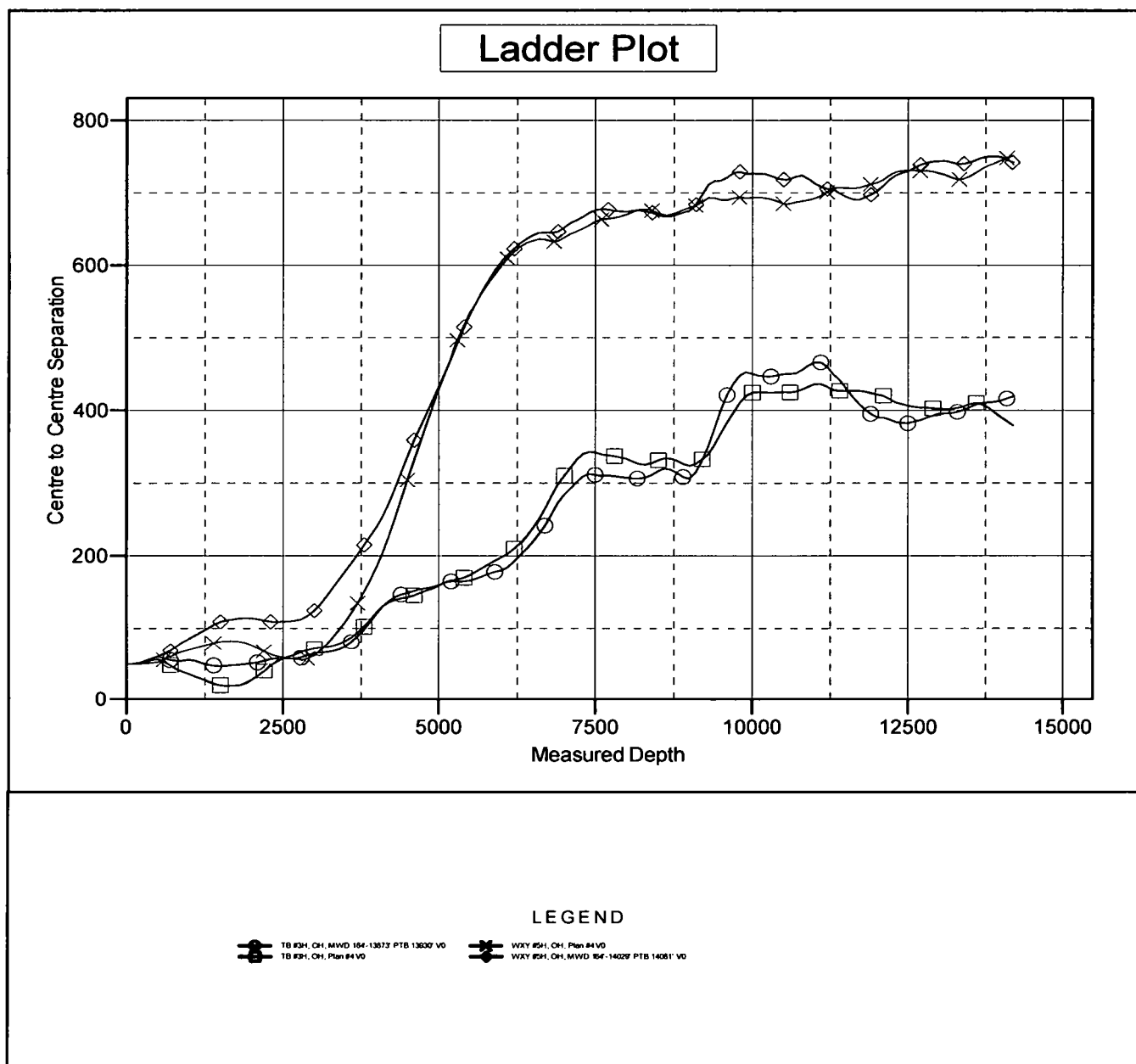
Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Offset Design Hermes Fee 23-28-30 - WXY #5H - OH - Plan #4													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IFR1, 4000-MWD+IFR1, 8000-MWD+IFR1													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,200.00	9,583.30	14,156.70	9,439.90	57.83	50.46	78.90	4,589.66	285.82	751.44	658.05	93.39	8.046		
14,203.00	9,583.18	14,159.70	9,439.85	57.85	50.48	78.91	4,592.66	285.81	751.55	658.11	93.44	8.043		

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WA #1H
Project:	Eddy County, NM	TVD Reference:	Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
Reference Site:	Hermes Fee 23-28-30	MD Reference:	Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	WA #1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WellPlanner1
Reference Design:	MWD 164'-14143' PTB 14203'	Offset TVD Reference:	Offset Datum

Reference Depths are relative to Well @ 3143.50usft (GL: 3117' + KB:
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: WA #1H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.11°



Company: Marathon Oil
Project: Eddy County, NM

Reference Site: Hermes Fee 23-28-30

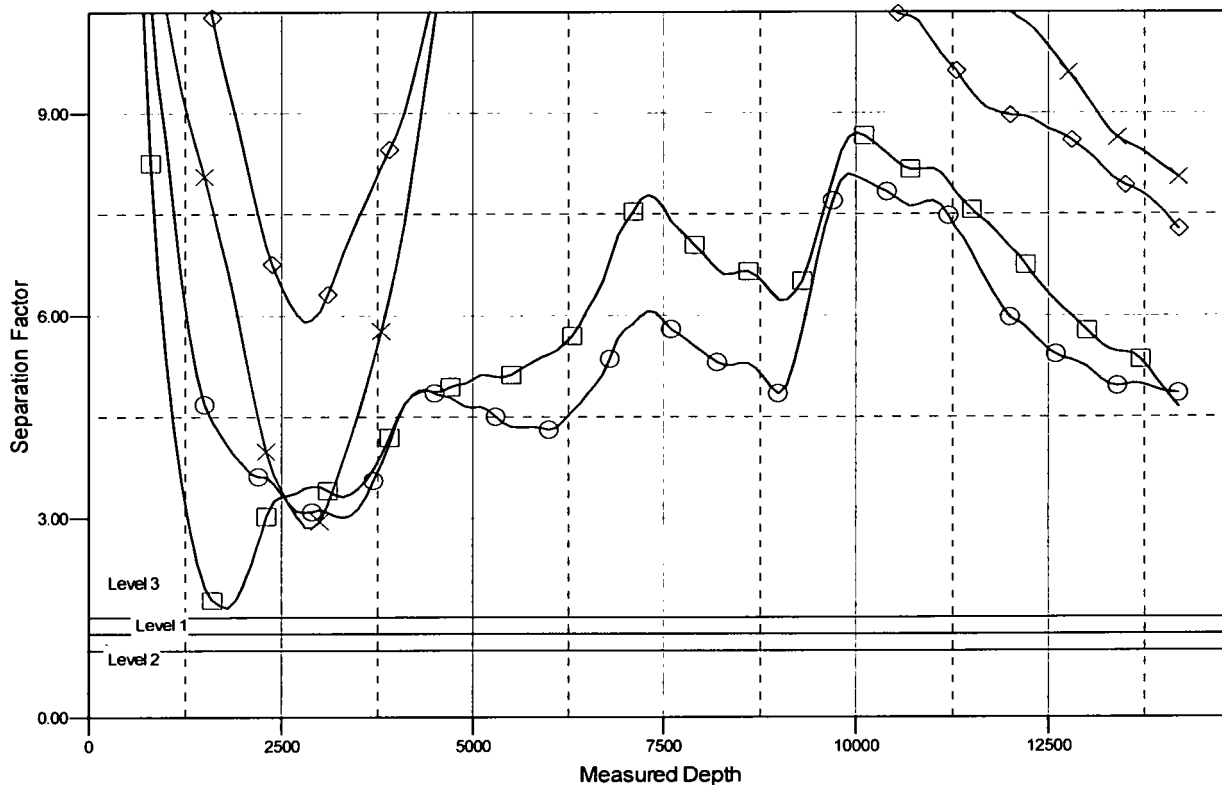
Site Error: 0.00 usft
Reference Well: WA #1H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: MWD 164'-14143' PTB 14203'

Local Co-ordinate Reference: Well WA #1H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: WellPlanner1
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3143.50usft (GL: 3117' + KB:
 Offset Depths are relative to Offset Datum
 Central Meridian is -104.333334

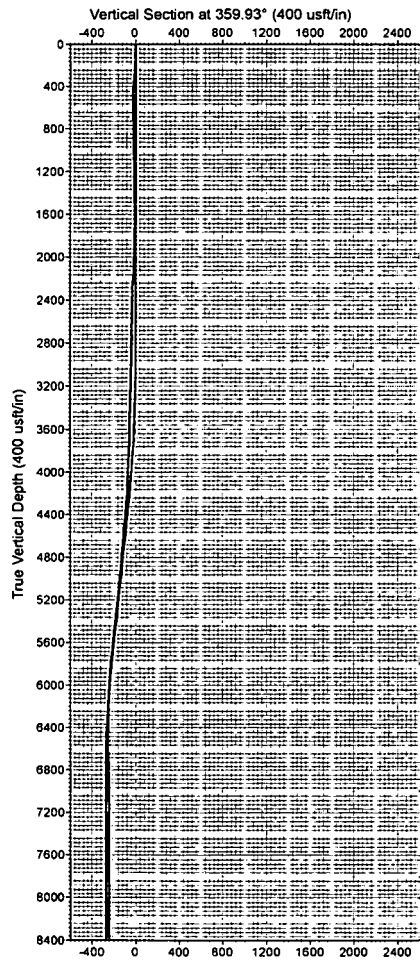
Coordinates are relative to: WA #1H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.11°

Separation Factor Plot



LEGEND

 TB #3H, CH, MWD 164'-13873' PTB 13600' VD
 WXY #5H, CH, Plan #4 VD
 WXY #5H, CH, MWD 164'-14203' PTB 14051' VD



Marathon Oil
Eddy County, NM
Hermes Fee 23-28-30
WA #1H
Plan #2 - FINAL PVA
GL: 3117' + KB: 26.5' (H&P480)

US State Plane 1927 (Exact solution)
NAD 1927 (NADCON CONUS)
Clarke 1866
New Mexico East 3001
Mean Sea Level

RKB Elevation: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Spot
0.00	0.00	461896.34	565052.01	32.269695	-104.122868	

SECTION DETAILS

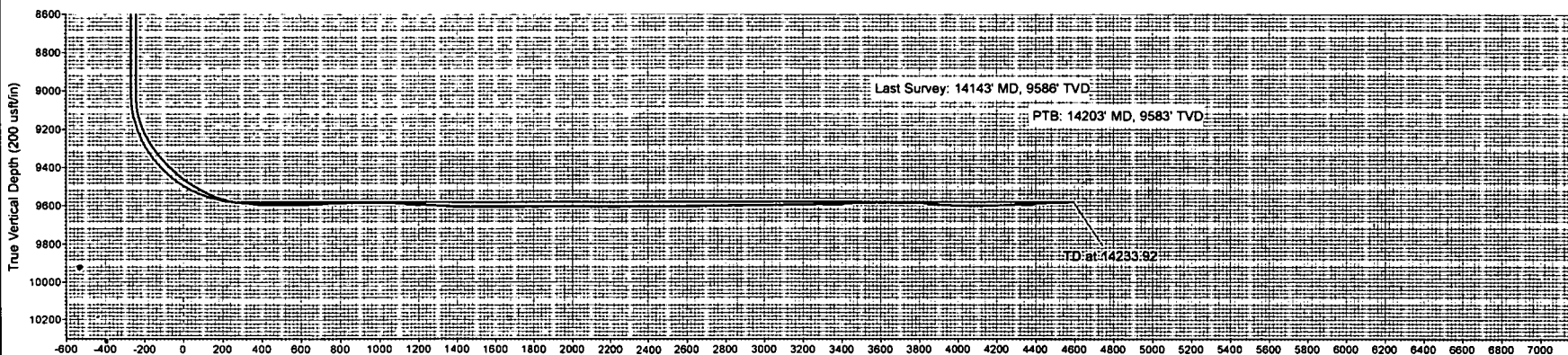
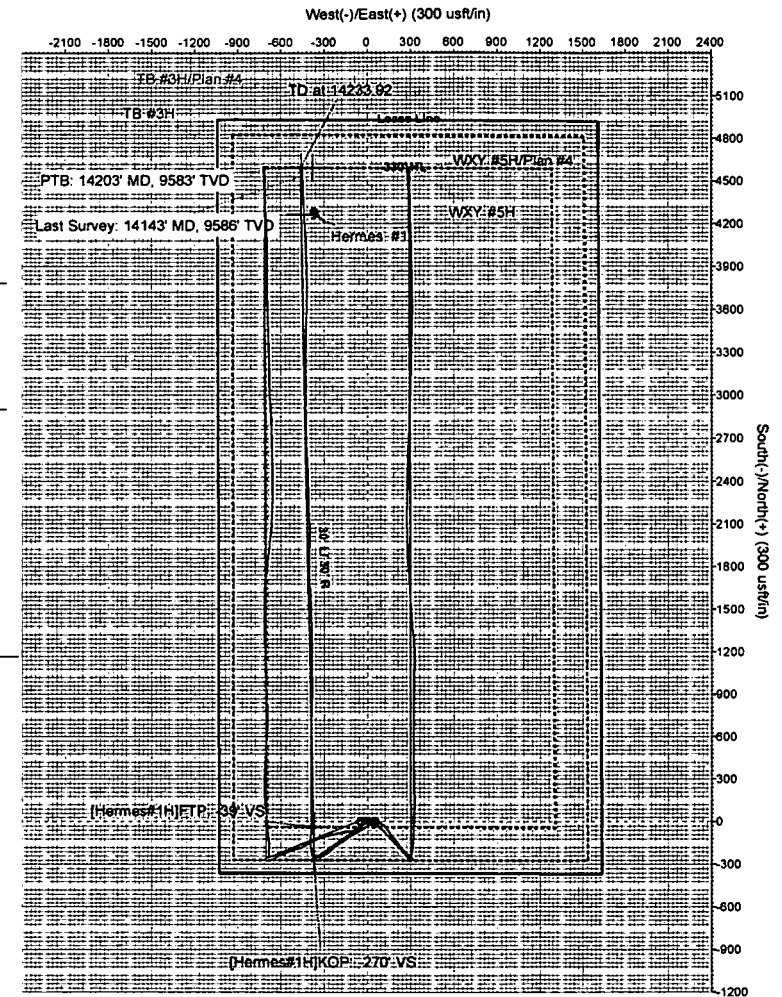
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	3000.00	0.00	0.00	3000.00	0.00	0.00	0.00	0.00
3	4333.33	10.00	234.12	4326.57	-68.02	-94.04	0.75	-67.90
4	5816.91	10.00	234.12	5787.61	-218.99	-302.79	0.00	-218.62
5	6816.91	0.00	0.00	6782.54	-270.00	-373.32	1.00	-269.54
6	9043.37	0.00	0.00	9009.00	-270.00	-373.32	0.00	-269.54
7	9943.36	90.00	358.82	9581.96	302.85	-384.15	10.00	303.32
8	13901.88	90.00	358.82	9582.00	4260.66	-459.01	0.00	4261.22
9	13952.56	90.00	359.83	9582.00	4311.33	-459.52	2.00	4311.89
10	14233.92	90.00	359.83	9582.00	4592.70	-459.88	0.00	4593.26

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[Hermes#1H]FTP: -39' VS	0.00	-39.51	-373.32	461856.83	564678.69
[Hermes#1H]LTP/BHL: 4593' VS	0.00	4592.80	-378.98	468489.14	564673.03
[Hermes#1H]KOP: -270' VS	9009.00	-270.00	-373.32	461626.34	564678.69
[Hermes#1H]LP1	9582.00	4260.66	-459.01	468157.00	564593.00
[Hermes#1H]NewBHL: 4593' VS	9582.00	4592.70	-459.88	468489.04	564592.15



Target Line: 9582' TVD @ 0' VS: 90° INC



Azimuths to Grid North
True North: -0.11°
Magnetic North: 7.29°

Magnetic Field
Strength: 48014.5nT
Dip Angle: 60.04°
Date: 12/9/2017
Model: USER DEFINED

Azimuth Corrections

Total Magnetic Corr. (M to G): 7.29°

Declination (M to T): 7.40° East